

**EFFECTIVENESS OF VIRTUAL REALITY THERAPY  
UPON STRESS AMONG NURSES**

**BY  
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**A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R  
MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILLMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE IN NURSING**

**APRIL 2015**

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UPON STRESS AMONG NURSES**

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## **DECLARATION**

I hereby declare that the present dissertation entitled “**A Quasi Experimental Study to Assess The Effectiveness of Virtual Reality Therapy upon Stress among nurses**” is the outcome of the original research work undertaken and carried out by me, under the guidance of **Dr. Latha Venkatesan, M.Sc., (N), M.Phil., (N), Ph.D., (N), M.B.A., Principal**, Apollo College of Nursing and **Prof. Vijayalakshmi. K, M.Sc., (N), M.A. Psychology, Ph.D., (N)**, Head of Mental Health Nursing Department, Apollo College of Nursing, Chennai.

I also declare that the material of this has not found in any way, the basis for the award of any degree or diploma in this university or any other universities.

**M.Sc (N) II Year**

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## **SYNOPSIS**

A Quasi Experimental Study to Assess the Effectiveness of Virtual Reality Therapy upon Stress among Nurses at Apollo Hospital, Chennai.

### **Objectives of the study**

1. To assess the level of stress in control group & experimental group of nurses before and after administration of virtual reality therapy.
2. To evaluate the effectiveness of virtual reality therapy by comparing the level of stress in control group & experimental group of nurses before and after administration of virtual reality therapy.
3. To determine the level of satisfaction among experimental group of nurses regarding administration of virtual reality therapy.
4. To find out the association between selected variables and the level of stress in control and experimental group of nurses before and after administration of virtual reality therapy.

The Transactional Theory of Stress and Coping developed by Lazarus and Folk man (1984) was used as the theoretical framework for this study. This model emphasizes the ongoing and the reciprocal interaction between the person and the environment (Zedeck, 2009).

A quasi experimental pre test and post test research design was adopted for conducting this study. The study was conducted at Apollo Hospital, Chennai (Control and Experimental group). A sample size of 60 nurses who meet the inclusion criteria were chosen for this study, in that 30 nurses were taken for

control group and 30 nurses were taken for experimental group by purposive sampling technique in same setting.

The data collection tools were validated and the reliability was established through test-retest and split half technique.

Data was collected using validated tools such as, Demographic Variable proforma, Cohen et al Perceived Stress Scale and Rating Scale on level of satisfaction of virtual reality therapy. The validity was obtained from various experts and reliability was obtained and found to be highly reliable. The main study was conducted after the pilot study.

The data was collected by using the predetermined and pretested tools such as demographic variable Performa, perceived stress scale by Cohen et al 1983, and level of satisfaction scale. The data collection was done for the period of 5 weeks on selected samples.

Study participants gathered in common recreation hall in the hostel block. Techniques of Virtual Reality Therapy were demonstrated by the researcher and further practiced by the study participants for a period of 1 week. The study participants in experimental group was administered VRT for 5-7 minutes each every day for 2 hours 30 minutes. After 2 weeks Stress was assessed by Cohen et al Perceived Stress Scale both in control and experimental group. Then the level of satisfaction regarding virtual reality therapy was assessed using the satisfaction rating scale on virtual reality therapy. On the whole virtual reality therapy was found to be feasible and effective.

## Major Findings of the study

- Majority of the nurses were aged between 20-25 years (86.6%) with the mean age of 23 years in experimental group, were qualified with B.Sc (N) (66.6%, 86.6%) and had <5 years of experience in control and experimental group respectively. All of the nurses were females (100%, 100%), significant percentage of the nurses had previous knowledge regarding VRT (13.3%, 13.3%) and qualified with GNM (33.3%, 23.3%) in control and experimental group respectively. More than half of the nurses were aged between 20-25 yrs (53.3%) in control group.
- Most of them had moderate stress (73.3%, 90%) in control and experimental group of nurses in pre test. However in experimental group after virtual reality therapy significant of them had mild level of stress (80%) and (20%) moderate level of stress. Whereas in control group most of them had moderate level of stress (60%) followed by mild level of stress (40%).
- The mean stress score of control group of nurses in pre-test was ( $M= 40.7$ ,  $SD= 1.9$ ) and that of post test ( $M=33$ ,  $SD= 2.1$ ) in which the difference is not statically significant ( $P>0.05$ ).
- In experimental group the mean stress score is lesser in post test than in pre test ( $M=38$ ,  $SD=3$ ) and ( $M=40.6$ ,  $SD=2$ ) which is statistically significant ( $P<0.001$ ). It can be attributed to the effectiveness of Virtual reality therapy on reducing stress. Hence the null hypothesis  $H_01$  is rejected.
- There is significant association between the nurses' working area (general ward) and the level of stress in experimental group thus the null hypothesis



Ho2 – There will not be any significant association between selected variables and level of stress in control group and experimental group of nurses before and after administration of virtual reality therapy was rejected, whereas there is no significant association between other variables like age, gender, professional Qualification, previous knowledge of VRT and stress. Hence the null hypothesis Ho2 –There will not be any significant association between the selected demographic variables like age, gender, professional qualification and previous knowledge and level of stress in experimental group of nurses before and after administration of virtual reality therapy was retained.

- The researcher found that all of nurses were highly satisfied (100%) regarding the intervention of virtual reality therapy. These findings indicated that the administration of virtual reality therapy is effective in reducing the stress level.

### **Recommendations**

- The study can be conducted on larger sample to generalize the results.
- The study can be conducted among the other health care professionals who also experience stress.
- The study can be conducted in community settings among different population like menopausal women and old age population.
- A comparative study can be conducted to evaluate the effectiveness of various other interventions to help the nurses in reducing their stress and to cope up with stress in the day to day life.
- A comparative study can be conducted to assess the level of stress among nurses and other health care professionals.

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# CHAPTER I

## INTRODUCTION

### Background of the study

*“We don’t know who we are until we see what we can do”*

**- Martha Grimes**

Today mental disorders stand among the leading cause of disease and disability in the world. One in four (25%) people in the world will be affected by mental or neurological disease at some point in their lives. Being ‘stress’ as a universal phenomena reflecting in each aspect of lifecycle, was identified as a major cause of attrition among all categories of people. Although stress affects the biophysical and emotional wellbeing of the people, it varies with age, gender, mental capabilities and environmental conditions.

In psychology, stress is a feeling of strain and pressure. Symptoms may include a sense of being overwhelmed, feelings of anxiety, overall irritability, insecurity, nervousness, social withdrawal, loss of appetite, depression, panic attacks, exhaustion, high or low blood pressure, skin eruptions or rashes, insomnia, lack of sexual desire (sexual dysfunction), migraine, gastrointestinal difficulties (constipation or diarrhea), and for women, menstrual symptoms. It may also cause more serious conditions such as heart problems. Also, experimental research which has been performed on animals, also displayed results relating to stress and negative effects on the body. It has been shown that stress contributes to the initiation and development of specific tumors within the body.

Small amounts of stress may be desired, beneficial, and even healthy. Positive stress helps improve athletic performance. It also plays factor in motivation, adaptation, and reaction to the environment. Excessive amounts of stress however, may lead to many problems in the body that could be harmful. Three diseases that are influenced by stress are clinical depression, cardiovascular disease, and human immunodeficiency virus (HIV).

Stress can be external and related to the environment, but may also be created by internal perceptions that cause an individual to have anxiety or other negative emotions surrounding a situation, such as pressure, discomfort, etc., which they then deem stressful, for example in PTSD.

External factors that by themselves are not threatening or stressful are deemed such for someone experiencing PTSD. Triggers can be stressful, such as when a person reports stress when hearing a song on the radio or seeing a type of object that may remind the person of prior threatening events. Humans experience stress, or perceive things as threatening, when they do not believe that their resources for coping with obstacles (stimuli, people, situations, etc.) are enough for what the circumstances demand. When we think the demands being placed on us exceed our ability to cope, we then perceive stress. For managing with stress certain interventions can be used among which Virtual Reality therapy is one of them.

Virtual reality (VR) is a computer-simulated environment that can simulate physical presence in places in the real world or imagined worlds. Most current virtual reality environments are primarily visual experiences, displayed either on a computer screen or through special stereoscopic displays, but some



simulations include additional sensory information, such as sound through speakers or headphones. Some advanced, hepatic systems now include tactile information, generally known as force feedback in medical, gaming and military applications.

Virtual reality is an artificial environment created by software and projected by capturing the user by sensor. The user will be projected in the screen as a disease free user. There are various games software available in virtual reality therapy which can be administered on the basis of patient's condition. Kinetic adventures compact disc is one of the game which can be administered to the population of nurses as it helps to reduce the burnout, workload, tension.

Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. It makes physical therapy interactive for psychological & Medical condition. It replicates real life situation and plays a vital role in Rehabilitative program for vertigo, tinnitus, vocal injuries, stress, phobia, headache, dementia, Parkinson's, Alzheimer's, and Schizophrenia.

Virtual reality therapy help patients to challenge and correct negative thinking patterns about certain circumstances that trigger dysfunctional emotional responses. It helps to stimulate learning by improving the cognitive skills, creative thinking, and self esteem.

Doctors and therapist often use this process to help the patients face and overcome fears, phobias and any stressful conditions. All of this can be done in a monitored, controlled, censored, projector viewed theatre environments, tailored to the needs of each individual patient.

The Virtual reality therapy is one among the relaxation technique which helps the individual to cope with the stressful situations and the ways to resolve them. Thus, the health care professionals including nurses must pain for the strategy such as VRT to reduce the level of stress which in turn, helps the individual to cope with the hurdles and gain the targeted goals.

Furthermore, virtual reality covers remote communication environments which provide virtual presence of users with the concepts of telepresence and telexistence or a virtual artifact (VA) either through the use of standard input devices such as a keyboard and mouse, or through multimodal devices such as a wired glove, the Polhemus, and unidirectional treadmills. The simulated environment can be similar to the real world in order to create a lifelike experience—for example, in simulations for pilot or combat training—or it can differ significantly from reality, such as in VR games.

In practice, it is currently very difficult to create a high-fidelity virtual reality experience, due to large technical limitations on processing power, image resolution, and communication bandwidth; however, the technology's proponents hope that such limitations will be overcome as processor, imaging, and data communication technologies will become more powerful and cost-effective over time.

### **Need for the study**

Stress has been categorized as an antecedent or stimulus, as a consequence or response, and as an interaction. Stress is “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding

his or her resources and endangering his or her well-being.” Stress is not inherently deleterious, each individual’s cognitive appraisal, their perceptions and interpretations, gives meaning to events and determines whether events are viewed as threatening or positive personality traits also influence the stress equation because What may be overtaxing to one person may be exhilarating to another. Work stress in nursing was first assessed in 1960 when Menzies identified four sources of anxiety among nurses: Patient care, decision-making, taking responsibility, and change. The nurse’s role has long been regarded as stress-filled based upon the physical labor, human suffering, work hours, staffing, and interpersonal relationships that are central to the work nurses do. Since the mid-1980s, however, nurses’ work stress may be escalating due to the increasing use of technology, continuing rises in health care costs, and turbulence within the work environment.

Freudenberger (1974) coined the term “burnout” to describe workers’ reactions to the chronic stress common in occupations involving numerous direct interactions with people. Burnout is typically conceptualized as a syndrome characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment.

Moreover Independent from family life; these domains may even be in conflict. Stress may result from the combined responsibilities of work, marriage, and children. The effects of both work and non work stress among nurses have been studied infrequently. And yet, non work stress may be particularly salient to nursing, a predominantly female profession. Women continue to juggle multiple roles, including those roles related to the home and family, for which the women

may have sole or major responsibility. Nurses predominately being women experience more stress due to various factors such as shift duty, multiple responsibilities, shortage of staff, overload etc.

Nevertheless, work stress and burnout remain significant concerns in nursing, affecting both individuals and organizations. For the individual nurse, regardless of whether stress is perceived positively or negatively, the neuroendocrine response yields physiologic reactions that may ultimately contribute to illness. However there are strategies and psychological intervention which helps in reducing and coping with stress more effectively. Among this virtual reality therapy is one of the important intervention and relaxation techniques which reduce stress.

Stress is simply a reaction to a stimulus that disturbs our physical or mental equilibrium. Stress has been identified as a 20<sup>th</sup> century disorder and has been viewed as a dynamic transaction between individuals and their environment. Personal characteristics and the nature of the environmental events are considered. Stress as the event that triggers the adaptive physiological and psychological responses in an individual. The event creates change in life pattern of the individual, requires significant adjustment in life style, and taxes available personal resources (Townsend, 2010).

Stress can be regarded as a psychological threat, in which the individual perceives a situation as a potential threat .Imagination in this sense not been limited to the acquisition of exact known requirements of a practical necessity is, up to a certain point, free from objective restraints. The ability to imagine one's self in another person's place is very important to social relations and

understanding. The world as experienced is an interpretation of data arriving from the senses, as such it is perceived as real by contrast to most thoughts and imaginings.

All health care professionals are highly stressed due to various reasons. Among all health care professionals nurses contribute the majority of population. Globally, more than 70% of hospital staff population is constituted by nursing professionals.

There are many psychosocial intervention, complementary and relaxation technique which helps in coping with stress effectively. Among these, virtual reality is one of the therapy that allows a person to participate actively in a sense of being present in the virtual environment. Virtual reality has been proposed as a new way of conducting exposure therapy because it can provide a sense of being present in a feared situation. This method appears to have several advantages over standard exposure therapy. First, virtual reality may offer patients a greater sense of control because they can instantly turn the device on and off or change its level of intensity. Second, virtual reality would protect patients from harm or social embarrassment during their practice sessions. Third, it could be implemented regardless of the patient's ability to imagine or to remain with prolonged imaginable exposure.

Virtual reality treatment which refers to immersive, interactive, multisensory, viewer centered, censored, projector viewed theatre environments which can be explored and interacted with by a person. Thereby the person feels relief from his problems by permanently registering the positive effects in brain. Doctors and therapist often use this process to help the patients face and overcome

fears, phobias and any stressful conditions. However there is paucity of research in this area especially stress among nurses. Virtual reality procedure is central to cognitive therapy are cognitive change techniques, sometimes called “Cognitive restructuring”. These procedures help patients challenge and correct negative thinking patterns about certain circumstances that trigger dysfunctional emotional responses. Relaxation training and breathing exercises are often used adjunctively to cognitive techniques to provide anxious individual with a skill to decrease symptoms of over arousal. Virtual reality is an artificial environment created by software and projected by capturing the user by sensor. The user will be projected in the screen as a disease free user. Successful virtual environments depend on the smooth integration of Visual Display, Head position sensing, Hand-position sensing, Force feedback, Sound input and output, Cooperative and competitive virtual reality. Virtual reality stimulates learning improve goal setting, improve social skills, reduce stress, improve math skills, improve language skills, improve creative thought, improve cognitive skills ,improve decision making and improves self esteem.

However there is paucity of research on virtual reality therapy upon stress among nurses. Thus, this study is aimed to assess the effectiveness of virtual reality therapy upon stress among nurses.

### **Statement of the problem**

A Quasi Experimental Study to assess the Effectiveness of Virtual Reality Therapy upon Stress among nurses in Apollo Hospital, Chennai.

### **Objectives of the study**

1. To assess the level of stress in control group & experimental group of nurses before and after administration of virtual reality therapy.
2. To evaluate the effectiveness of virtual reality therapy by comparing the level of stress in control group & experimental group of nurses before and after administration of virtual reality therapy.
3. To determine the level of satisfaction among experimental group of nurses regarding administration of virtual reality therapy.
4. To find out the association between selected variables and the level of stress in control and experimental group of nurses before and after administration of virtual reality therapy.

### **Operational definitions**

#### **Effectiveness**

It refers to the significant reduction in the level of stress after administration of virtual reality therapy in experimental group as measured by Cohen et al's perceived stress scale.

#### **Virtual reality treatment**

Virtual reality therapy refers to immerse, interactive, multi sensory, viewer centered, censored, projector viewed theater environments which can be explored and interacted by a person. The person becomes a part of this virtual world or is immersed within this therapeutic environment and whilst, there is possibility to manipulate objects or perform a series of actions displayed on the screen. Thereby the person feels reduce in stress. This intervention is made by the appropriate

movements by the individual depending upon to the task designed in the reality therapy. This is given for 5-7 minutes every day for 2 weeks.

### **Stress**

Stress is an individual's reaction to any change that requires an adjustment or response, which can be physical, mental, or emotional as measured by Cohen et al's perceived stress scale.

### **Satisfaction**

It is a feeling of gratification attained or achieved by the nurses with Virtual reality therapy as measured by self rating scale developed by the investigator.

### **Assumptions**

- Stress is very common in any individual
- Stress is manageable
- Nurses may be Stressed due to the work load in hospital
- Prolonged Stress leads to poor physiological, psychological disturbance and social relationship in nurses.

### **Null hypotheses**

**Ho1:** There will be no significant difference in level of stress in control and experimental group of nurses before and after administration of virtual reality therapy.



**Ho2:** There will be no significant association between selected variables and level of stress in control group and experimental group of nurses before and after administration of virtual reality therapy.

### **Delimitations**

- Study period was limited to 5 weeks only.
- Study was restricted to nurses working in Apollo hospital Vanagaram.
- Nurses those who not are willing to participate in study.

### **Conceptual framework of the study**

A framework is a group of concepts and set of propositions that spell out the relationship between them. Their overall purpose is to make scientific findings meaningful and generalized.

The conceptual framework for a particular study is the abstract, logical structure that enables the researcher to link the findings to nursing body of knowledge.

### **Transactional Theory of Stress and Coping**

The Transactional Theory of Stress and Coping developed by Lazarus and Folkman (1984) was used as the theoretical framework for this study. This model emphasizes the ongoing and the reciprocal interaction between the person and the environment (Zedeck, 2009). Based on this theory, stress is not located in the person or the environment separately, but in the relationship between the environment, person's appraisals of the environment, and ongoing attempts to cope with issues that arise (Cooper et al, 2001).

In this theory, two processes identified the interaction between the person and the environment. In the first process, cognitive appraisal, one evaluates the relevance and the impact of a particular encounter with the environment to the well-being of the person. This involves appraisal of potential stressors as threatening and posing some kind of threat to the individual. Cognitive appraisal is proposed to play an important role in the coping process. As the environment is always changing, persons perceive different stressful situations in different manners and differ their use of coping strategies across stressful situations. This means that flexible stress appraisal facilitates flexible coping responses (Cheng & Cheung, 2005).

The second process „coping manages particular external and internal needs that are evaluated as challenging or exceeding one’s resources by altering cognitive and behavioral efforts (Lazarus & Folkman, 1984: 141). This involves the evaluation of coping resources and alternative responses. If a person perceives that a situation is threatening, but has the capability to cope with it, then distress is not experienced and this situation is perceived as challenging (Zedeck, 2009).

In the model, coping is seen as a fundamental process on how persons interact with the environment and is an ongoing, growing process that occurs within the line of altering persons and situational demands (Cheng & Cheung, 2005). Similarly, Folkman & Moskowitz (2004) has defined coping as the thoughts and behaviors used by persons to manage both the external and internal demands of conditions that are evaluated as stressful. Wilhelm (2002) found that some persons tend to vary their ways of coping in different situations, whereas others tend to use the same ways regardless of situational features.

A distinction is commonly made between problem focused coping, which seeks to solve the demands of a stressor, and emotion focused coping, which helps the individual to feel better about the stressor (Cooper et al, 2001). Distress arises when a person evaluates the demands of a specific situation as about to exceed available resources and to be a threat his/her well-being, requiring a change in individual functioning to return balance (Lazarus, 1966).

Fickova (2002) reported that affectivity (positive and negative) determines which coping strategy to be used at the time of the stressful situation. If emotions were intensive, they change the nature of the information-processing approach and hint to the person that something is wrong (Boekaerts, 2002; Klinger, 1996), and if emotions were of low intensity, they signal that everything is fine (Fredrickson, 2001).

A potentially stressful event will produce the primary appraisal process in which a person evaluates the extent of threat in relation to his/her wellbeing. When an event is perceived as threatening or a challenge, the secondary appraisal process provides a global evaluation of the individual's coping resources and ability to manage the threat/challenge. Coping responses start after the cognitive appraisals and the stress outcomes of this potentially stressful event are based on the effectiveness of one's cognitive appraisals and coping processes. The stress results will then feed back to the cognitive appraisal stages for more actions if required. (Folkman & Lazarus, 1991)

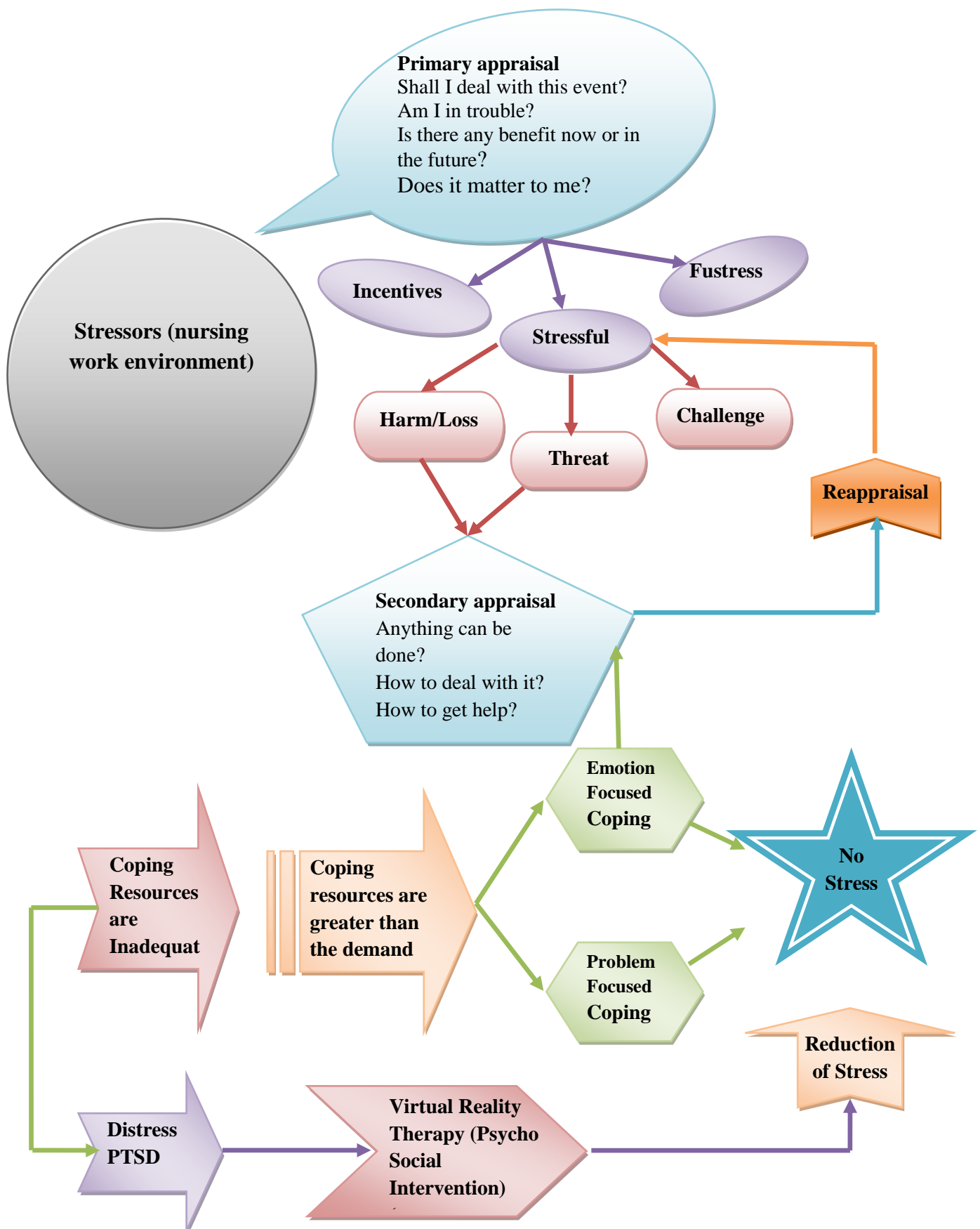


Fig. 1: Theoretical Framework by Lazarus and Folk Man

Although the transactional theory can predict individual differences in the experience and reaction to stress, it cannot predict which aspects of the work environment will be stressful (Cheng & Cheung, 2005). Figure 1 summarizes how Transaction Model of Stress and Coping was used in this study.

The transactional theory of stress and coping framework has been chosen as the most appropriate for this study because of its flexibility (Ross & Altmaier, 1994) and because the psychological enquiry about beliefs, views and practices related to stress among nurses. In addition to that, the transactional model has several strengths; it explains coping in steps, underscores the importance of thinking, perception, and determination of controllability, emphasizes the role of chronic stressors or daily hassles as being more important than once-in-a-while life events; tracks into account the interaction between individual and environment; and has a feedback mechanism in the form of appraisal (Sharma & Romas, 2012).

Other considered models were criticized seriously, so they were not adopted in this study. Cannon-Selye tradition was criticized for the concepts that reactions of individuals to stress are uniform (Lazarus & Folkman, 1984) and for explaining stress in terms of outcome, which suggests that one is forced to wait until the outcome to know when stress will happen (Hobfoll, 1989). The person-environment fit theory has been criticized primarily for lack of conceptualization of the environment (E) component of fit (Schneider, 2001). The job demands-control model was criticized for not taking worker's individual characteristics into account (Parkes, 1991), and for unclear about the mechanism of coping.

## **Projected Outcome**

Thus Virtual reality therapy will be useful to reduce the stress among nurses. In turn it will help them to deal with their work effectively and also to cope up with day to day stressors and improve the quality of life.

## **Summary**

This chapter deals with selection of research approach, research setting, population, sample size, sampling technique, sampling criteria, selection and development of study instruments, validity and reliability, data collection procedure and plan for data analysis.

## **Organization of the Report**

Further aspects of the study are presented in the following five chapters.

**In Chapter II** : Review of literature

**In Chapter III** : Research methodology which includes research approach, design, setting, population, sample, sampling techniques, tool description, content validity and reliability of tools, pilot study, data collection procedure and plan for data analysis.

**In Chapter IV** : Analysis and interpretation of data

**In Chapter V** : Discussion

**In Chapter VI** : Summary, conclusion, implications, recommendations and limitations.

The report ends with selected references and annexure.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Review of literature is a key step in the research process. The typical purpose of analyzing a review of existing literature is to generate questions and to identify what is known and what is unknown about the topic. The major goals of review of literature are to develop a strong knowledge base to carry out research and non research scholarly activity.

The review of literature is presented under the following headings.

- Literature related to Stress among Nurses
- Literature related to Virtual Reality Therapy
- Literature related to Effectiveness of Virtual Reality Therapy upon Stress

#### **Literature related to Stress among Nurses**

A study was conducted by Yoder et al in 1999 “to determine whether the personality trait of hardiness is a predictor of burnout” Forty-nine registered nurses working in 7 special care units completed the Tedium Burnout Scale, the Nursing Stress Scale, and the Hardiness Test. Results indicate that burnout, stress, and hardiness had a significant relationship ( $P < .001$ ). Hierarchical multiple regression analysis indicated that hardiness alone accounted for 35% of burnout variance ( $P < 0.05$ ) and that the addition of stress had no effect. However, in this study, nurses from the Burn Intensive Care Unit had the highest burnout and stress scores and the lowest hardiness scores of nurses from the 7 units. This study confirms findings by a previous study that hardiness is a predictor of burnout but is not a buffer in the stress-burnout relationship.

Van. et. al., conducted (2006) a study in 2006 to assess stress and burnout among nurses in a multispecialty hospital. High stress and staff turnover in a multispecialty pediatric area. Fifty-four percent ( $n = 14$ ) of the pediatric nurses completed a questionnaire booklet that included demographic data, the Burnout Inventory. Results indicated levels of burnout and distress comparable with larger studies. Conflict with doctors was the major source of stress, followed by workload, inadequate preparation in dealing with the emotional needs of patients and their families and death and dying. Conflict with doctors has not previously been identified as the major source of stress. However, workload and death and dying are commonly identified as sources in the literature. Suggestions for further research and the low response rate are discussed.

In 2005 John. et. al., conducted a study to evaluate the professional burnout among multispecialty hospital nurses, a study sample consisted of 227 nurses from general medical, neurological and psychiatric hospital wards. A set of 3 questionnaires was used, including Maslach Burnout Inventory (MBI), Coping Inventory for Stressful Situations (CISS) and Subjectively Perceived Stress (SPS). Average and high level of burnout in the emotional exhaustion (EE), depersonalization (D) and personal accomplishment (PA) was present at 71%, 39.8% and 77% of nurses respectively. A significantly higher level of burnout was noted in the subgroup of general medical nurses. The level of stress influences the professional burnout among nurses. There is diversity in the level of burnout depending on the specialization at work, which is not accompanied by a similar diversity in the subjectively perceived stress.



A study was conducted by Admi. et. al., (1999) to assess mental health and stress coping among specialty hospital nurses. A self-administrated questionnaire including questions on nursing work, the General Health Questionnaire (GHQ) as well as the Stress and Stress Coping questionnaire (SSCQ) was used. The subjects of this study were 225 female nurses. The results obtained were as follows, either of the following determinants was related to negative mental health: experience of 1-2 years; working in the operating room or in-patient department. 2) The subjects whose working experience was < 5 years or > or = 10 years had higher scores in the SSCQ. These findings suggest that because working conditions have a negative influence on mental health, educational system for both inexperienced and experienced nurses is needed to develop an effective stress-coping style in medical institutions.

Hwang. et. al., (2004) conducted a study to identify the factors influencing Symptoms of Stress among hospital staff nurses. Data was collected by questionnaires from 249 hospital staff nurses in three multi specialty Hospital. The score of the symptoms of stress showed a significantly positive correlation with the score of work stress ( $r=.22$ ,  $p=.00$ ). The most powerful predictor of symptoms of stress was social support and the variance explained was 16%. A combination of social support, ways of coping, and work stress account for 32% of the variance in symptoms of stress among hospital staff nurses. This study suggests that social support, ways of coping, self efficacy, hardiness, and work stress are significantly influencing factors on symptoms of stress among hospital staff nurses.

## **Literature related to Virtual Reality Therapy**

Daniela (2012) conducted a study to find out the relationship between interactive media and stress has gained wide interest in the mental health area. This study found that interactive experiences helped people manage their stress. By combining different techniques, which may produce more significant outcomes than single-strategy programs, a stress management protocol was developed to increase self-awareness, to control and relax oneself, induce positive emotions, and substitute negative emotions. Stress management protocol was tested in a controlled study comparing three interactive experiences (virtual reality [VR], video, and audio). Results showed the efficacy of all three interactive experiences in inducing positive emotions and integrating different approaches to manage stress. In particular, VR showed better improvements related to the psycho-physiological changes.

Mahajan (2012) conducted a study to assess the effectiveness of Virtual reality exposure therapy for PTSD (Post traumatic Stress disorders) in returning war fighters. This study was a randomized controlled clinical trial designed to assess the effectiveness of a novel intervention to treat combat-related PTSD in returning Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) war fighters. A cognitive behavior treatment approach augmented with virtual reality exposure therapy (VRE) was developed, and administered for 10 treatment sessions over 5 weeks. Comparisons with a control group receiving minimal attention (MA) for 5 weeks revealed that the VRE group had significant reductions in the avoidance/numbing symptoms on the Clinician Administered PTSD Scale (CAPS). The VRE group also had significant reductions in guilt at post-treatment compared to the control group.

A study was conducted by Malloy in 2010 to assess the effectiveness of virtual reality distraction for pain reduction: a systematic review. Virtual reality technology enables people to become immersed in a computer-simulated, three-dimensional environment. This article provides a comprehensive review of controlled research on the effectiveness of virtual reality (VR) distraction for reducing pain. To be included in the review, studies were required to use a between-subjects or mixed model design in which Virtual reality distraction was compared with a control condition or an alternative intervention in relieving pain. An exhaustive search identified 11 studies satisfying these criteria. Virtual reality distraction was shown to be effective for reducing experimental pain, as well as the discomfort associated with burn injury care. Studies of needle-related pain provided less consistent findings. Use of more sophisticated virtual reality technology capable of fully immersing the individual in a virtual environment was associated with greater relief. Overall, controlled research suggests that VR distraction may be a useful tool for clinicians who work with a variety of pain problems.

Robillard (2003) conducted a comparative study of reactions of phobic and non phobic participants in therapeutic virtual environments derived from computer games. In this study, inexpensive and readily adaptable PC computer games were used to provide exposure therapy to 13 phobic participants and 13 non-phobic control participants. It was found that anxiety could be induced in phobic participants by exposing them to photogenic stimuli in therapeutic virtual environments derived from computer games (TVEDG). Assessments were made of the impact of simulator sickness and of sense of presence on the photogenic effectiveness of TVEDGs. Participants reported low levels of simulator sickness,

and the results indicate that simulator sickness had no significant impact on either anxiety or sense of presence. Group differences, correlations, and regression analyses indicate a synergistic relationship between presence and anxiety. These results do not support Slater's contention that presence and emotion are orthogonal.

North (2003) conducted a study on virtual reality therapy in aid of senior citizens psychological disorders. The treatment for senior citizens suffering from psychological disorders seems to be different from therapeutic procedures used for other populations. The fear of flying treatment was chosen for this study. The subject of the study was a 62-year-old married female, whose anxiety and avoidance behavior was interfering with her normal activities. While under the virtual reality treatment, the subject experienced a number of physical and emotional anxiety-related symptoms. These symptoms included sweaty palms, loss of balance, weakness in the knees, etc. In this study, the virtual reality treatment caused a significant reduction in the anxiety symptoms in the subject and enhanced her ability to face phobic situations in the real world. Since termination of the treatment, she has taken several flights to professional conferences and reported feeling more comfortable and has fewer symptoms than those experienced prior to the VRT treatment.

### **Literature related to Effectiveness of Virtual Reality Therapy upon Stress**

Powers (2013) conducted a study to assess the effectiveness of virtual reality technology upon patients with stress. The operator is limited to pre-programmed avatars that cannot be controlled to interact and converse with the patient in real time. The current technology allows the operator to directly control

the avatar (including speaking) during VR conversations. Using an incomplete repeated measures (VR vs. in vivo conversation) design and random starting order with rotation counterbalancing, participants ( $N = 26$ ) provided ratings of stress and presence during both VR and in vivo conversations. Results showed that VR conversation successfully elevated stress ratings relative to baseline ( $d = 2.29$ ). Participants also rated their stress higher during VR conversation than during in vivo conversation ( $d = 0.85$ ). However, in vivo conversation was rated as more realistic than VR conversation ( $d = 0.74$ ). No participants dropped out and 100% completed both VR and in vivo conversations. Overall, the data suggest that the novel technology allowing real time interaction/conversation in VR may prove useful for the treatment of social anxiety in future studies.

Christopher (2007) conducted a study on virtual reality exposure therapy and standard (in vivo) exposure therapy in the treatment of fear and stress during flying. This controlled clinical trial tested virtual reality exposure therapy for the fear and stress of flying, a relatively new and innovative way to do exposure therapy, and compared it to standard (in vivo) exposure therapy and a wait list control with a 6- and 12-month follow-up. Twenty-three wait list participants completed randomly assigned treatment following the waiting period. Treatment consisted of 4 sessions of anxiety management training followed either by exposure to a virtual airplane or an actual airplane at the airport conducted over 6 weeks. Results indicate that virtual exposure therapy was superior to wait list on all measures, including willingness to fly on the post treatment flight (76% for virtual exposure therapy and standard exposure therapy; 20% for WL).

Alsina (2007) conducted a study on validity of virtual reality as a method of exposure in the treatment of test stress. Twenty-one students agreed to take part, 11 with high test stress and 10 with low test stress. The virtual environments were prepared in chronological order: the student's home, then the metro, and finally the corridor and lecture hall where the examination takes place. The results showed that the high-test-stress group presented higher levels of stress and depression than the low-test-anxiety group during exposure to the virtual environments. This study shows that virtual reality is able to provoke emotional responses in students with high test stress.

Jaye (2006) conducted a study on efficacy of virtual reality exposure therapy to treat driving phobia. A comprehensive search of the literature identified 13 studies that were included in the final analyses. Consistent with prediction the primary random effects analysis showed a large mean effect size for VRET compared to control conditions, Cohen's  $d = 1.1$ . This finding was consistent across secondary outcome categories as well. Also as expected in vivo treatment was not significantly more effective than VRET.

Anderson (2005) conducted a study on cognitive behavioral therapy for public speaking anxiety and stress using virtual reality for exposure. This study used an open clinical trial to test a cognitive-behavioral treatment for public-speaking anxiety and stress that utilized virtual reality as a tool for exposure therapy. Treatment was completed by participants meeting the Diagnostic and Statistical Manual of Mental Disorders DSM-IV criteria for social phobia, or panic disorder with agoraphobia in which public speaking was the predominantly feared stimulus. Treatment consisted of eight individual therapy sessions,

including four sessions of anxiety and stress management training and four sessions of exposure therapy using a virtual audience, according to a standardized treatment manual. Participants completed standardized self-report questionnaires assessing public-speaking anxiety and stress at pre-treatment, post-treatment, and 3-month follow-up. Results showed decreases on all self-report measures of public-speaking anxiety and stress from pre- to post-treatment, which were maintained at follow-up.

Schneider (2004) conducted a cross over study to explore the use of virtual reality as a distraction intervention to relieve symptom distress in women receiving chemotherapy for breast cancer. The study was conducted in the outpatient clinic of Midwestern comprehensive cancer center. This study was conducted in 20 women of 18-55 years of age. Using a crossover design, 20 subjects served as their own controls. For two matched chemotherapy treatments, one pretest and two post-test measures were employed and randomly assigned to receive the virtual reality distraction intervention during one chemotherapy treatment and received no distraction intervention (control condition) during an alternate chemotherapy treatment. Finding shows that significant decreases in symptom distress and fatigue occurred immediately following chemotherapy treatments when women used the virtual reality intervention.

Schneider (2003) conducted a study to examine the effects of a virtual reality distraction intervention on chemotherapy-related symptom distress levels in 16 women aged 50 and older. A cross-over design was used with a head-mounted display (Sony PC Glasstron PLM - S700) encompassing images and block competing stimuli during chemotherapy infusions. The Symptom Distress

Scale (SDS), Revised Piper Fatigue Scale (PFS), and the State Anxiety Inventory (SAI) were used to measure symptom distress. Participants were randomly assigned to receive the VR distraction intervention during one chemotherapy treatment and received no distraction intervention (control condition) during an alternate chemotherapy treatment. Analysis using paired t-tests demonstrated a significant decrease in the SAI ( $p = 0.10$ ) scores immediately following chemotherapy treatments when participants used VR. Evaluation of the intervention indicated that women thought the head mounted device was easy to use, they experienced no cyber sickness, and 100% would use VR again.

### **Summary**

This chapter has dealt with review of literature related to the problem stated. It has helped the researcher to understand the impact of problem under study. It has also enabled the investigator to design the study, develop the tool, and plan the data collection procedure and to analyze the data. The literatures presented here were extracted from eighteen primary and twelve secondary sources.



## **CHAPTER III**

### **RESEARCH METHODOLOGY**

The methodology of research study is defined as the way the information is gathered in order to answer the research question or to analyze the research problem.

This study was conducted to assess the effectiveness of virtual reality therapy upon stress among nurses in Apollo hospital, Chennai. This chapter deals in brief on different steps undertaken by the investigator for the study. It involves research approach, the setting, population, sample, sampling technique, selection of tool, content validity, reliability, pilot study, data collection procedure and plan for data analysis.

#### **Research Approach**

Research approach is the most significant part of any research. An quasi experimental research is an extremely applied form of research and involves finding out how well of a program and practice of policy are working. (Polit and Beck, 2012)

Its goal is to assess or evaluate the success of the program. To accomplish the objectives of this study, an experimental approach is considered most appropriate as the researcher wanted to assess the effectiveness of virtual reality therapy upon stress. In this study experimental research approach was used.

## Research design

A research design incorporates the most important methodological design that researcher work in conducting a research study (Polit and Beck, 2012).

A quasi experimental pre test and post test research design was adopted for conducting this study.

**O<sub>1</sub> - O<sub>1</sub>**

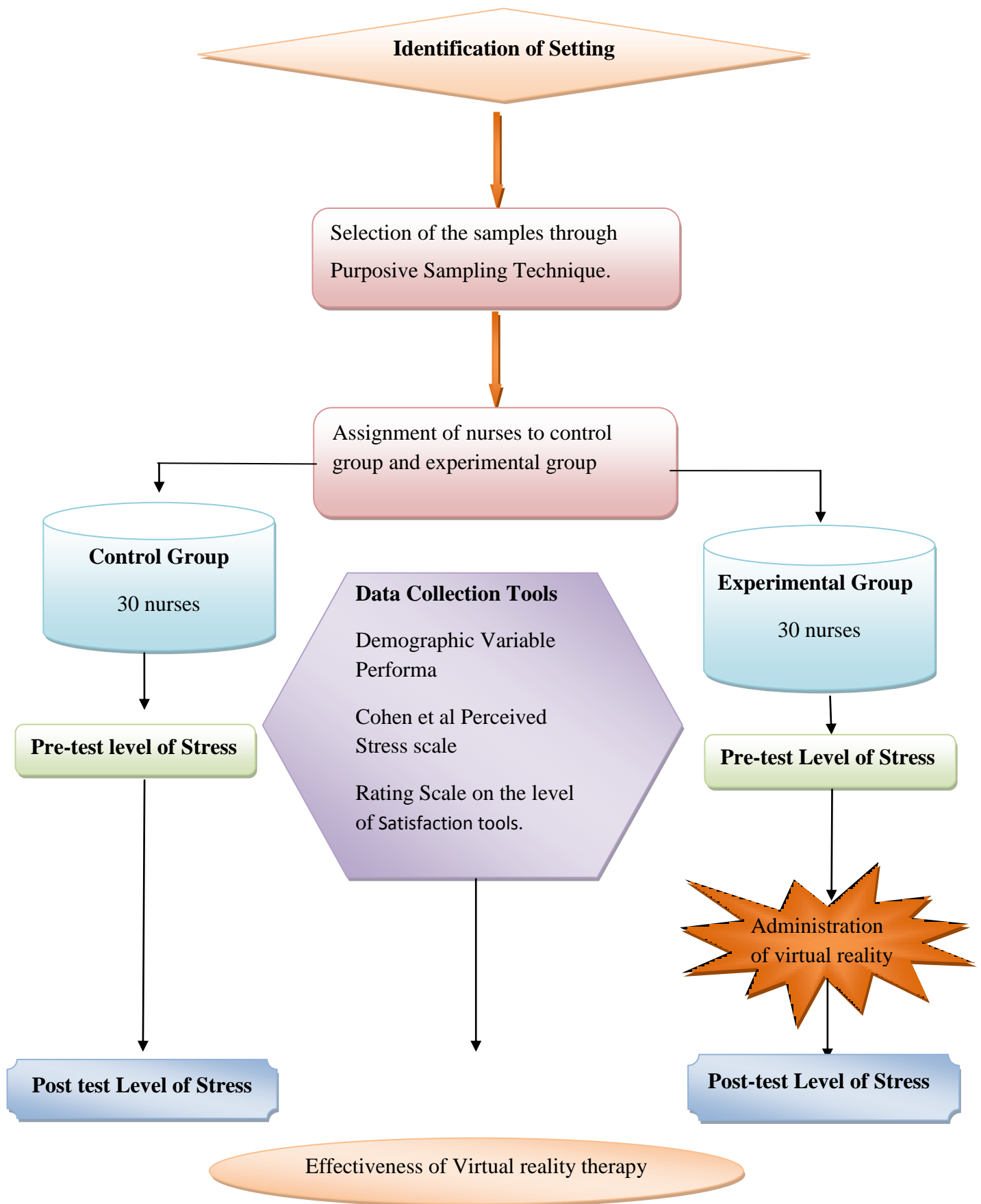
**O<sub>1</sub> X O<sub>2</sub>**

O<sub>1</sub> - Pre test of control and experimental group of nurses to assess the level of stress

X - Virtual reality therapy.

O<sub>2</sub> - Post test of control and experimental group of nurses to assess the level of stress

This intervention is made by the appropriate movements by the individual depending upon to the task designed in the reality therapy. This is given for 5-7 minutes every day for 2 weeks.



**Fig.2 Schematic Representation of the Research Design**

## **Variables**

Variable is an attribute that varies, that is takes on different values (Polit and Beck, 2012).

### **Dependent variable**

The variable hypothesized to be caused by another variable. In this study dependent variable is Stress.

### **Independent variable**

The variable hypothesized to the outcome variable of interest. In this study independent variable is virtual reality therapy. Virtual reality therapy is the simulation of physical presence in the real or imaginary world. The virtual reality therapy is often used to help patients face and overcome stress, fear and phobias. This can be done in a monitored, controlled, censored, projector viewed theater environment, tailored to the needs of each individual patient. It permanently registers positive effects in the brain.

### **Attribute variables**

A variable that confounds the relationship between the independent and dependent variables that needs to be controlled either in the research design or through statistical procedures (Polit and Beck, 2012).

Demographic variable such as age, gender, experience, were the attribute variables in this study.

## **Research setting**

According to Polit and Beck (2012), setting is the physical location and condition in which data collection takes place in a study.

The experimental group was selected from nurses working in Apollo Specialty Hospital, which is located at Vanagaram in Chennai, 20km away from central railway station. It is an unit of Apollo Hospital with bed strength of 350, there are 80 nurses working on 3 shifts.

The control group was also selected from Apollo Specialty Hospital. The setting was chosen on feasibility in terms of availability and accessibility of adequate samples.

## **Population**

Polit and Beck (2012) stated that the population is the entire aggregation of cases which meet designed set criteria. In this study, the target population comprises of nurses.

### **Target population**

The Target population is the group of population that the researcher aims to study and to whom the study findings will be generalized. In this study target population comprises of all nurses who satisfy the inclusion criteria.

### **Accessible population**

The Accessible population is the list of population that the researcher finds in the study area. The accessible population in this study was the nurses who satisfy the inclusion criteria in selected Hospital at Chennai.

## **Sample**

Polit and Beck (2012) stated that Sample consists of the subset of the units that comprises the population. A sample consists of nurses who met the inclusion criteria in selected hospitals at Chennai.

## **Sample size**

A sample size of 60 Nurses who met the inclusion criteria was chosen for this study, in that 30 were taken for control group and 30 were for experimental group.

## **Sampling technique**

It was stated by Polit and Beck (2012) that sampling referred to the process of selecting a portion of the population to represent the entire population. Sixty nurses were selected from Apollo specialty Hospital by purposive sampling technique. Among them 30 of them were selected for control group and 30 for experimental group conveniently.

## **Sampling Criteria**

### **Inclusion criteria**

- Working in Apollo hospital
- Available at the time of data collection

### **Exclusion criteria**

- Male nurses
- Nurses who are not willing to participate

## **Selection & development of study instruments**

The data collection instruments were developed through an extensive review of literature in consultation with experts and with the opinion of faculty members. The instruments used in this study were following;

- Demographic Variables Performa
- Cohen et al Perceived stress scale
- Rating Scale on level of satisfaction of virtual reality therapy

### **Demographic variable Performa of nurses**

Demographic variable Performa consists of age, Gender, total years of experience, professional qualification, working area, place of study.

### **Cohen et al Perceived stress scale**

The perceived stress scale is the most widely used psychological instrument for measuring the perceived of stress. It is standardized tool developed by Cohen et al (1983). The instrument has 14 items on stress. There are about 7 positive and 7 negative statements. It is a 5 point rating scale with responses ranging from 0-4. Each positive statement was scored as 0-4 and each negative statement was scored as 4-0. The total score of perceived stress scale was 56. (Cohen et al 1983).

Negative statements items no: 1, 2, 3, 8, 11, 12 and 14.

Positive statements items no: 4, 5, 6, 7, 9, 10 and 13.

Obtained score is interpreted as follows,

Score	Percentage	Level of stress
$\leq 27$	<50%	Mild
28-41	50-75%	Moderate
>41	> 75%	Severe

### **Rating scale to assess the level of satisfaction on Virtual Reality Therapy**

This is developed by the investigator based on the objectives of the study. Rating scale consists of 12 items (4 point rating scale) regarding virtual reality therapy. Responses extend from highly satisfied, satisfied, dissatisfied, and highly dissatisfied. Thus the total obtainable score is 0-48. Then the total score is obtained and the obtained score is converted into percentage and interpreted as follows,

Score	Percentage	Level of satisfaction
37-48	76-100%	Highly Satisfied
25-36	51-75	Satisfied
13-24	25-50	Dissatisfied
1-12	<25%	Highly Dissatisfied

### **Psychometric Properties of the Study Instruments**

#### **Validity**

Content validity is the degree to which an instrument measures what it is supposed to measure. Content validity is the sampling adequacy of the content being measured (Polit and Beck, 2012).

The perceived stress scale is the most widely used psychological instrument for measuring the perception of stress. It is standardized tool developed



by Cohen et al (1983). The content validity of the other tools was obtained by getting opinion from experts. The experts have suggested some specific modifications in the demographic variable Performa of nurses, and rating scale on the level of satisfaction regarding virtual reality therapy in nursing students. The modifications and suggestions of experts were incorporated in the final preparation of the tool.

### **Reliability**

Reliability is the degree of consistency with which an instrument measures the attribute which is designed to measure (Polit and Beck, 2012).

### **Perceived stress scale**

For Perceived stress scale the reliability related to internal consistency (measured by Cronbach's alpha) was 0.81. Test retest reliability was 0.81 which showed high positive correlation. Hence the tool was considered reliable for proceeding with the main study.

### **Pilot Study**

Polit and Beck (2012) stated that a pilot study is a miniature version of actual study in which the instruments are administered to the subjects drawn from the same population. The purpose is to find out the feasibility and practicability of the tool. The tools were modified when necessary.

The pilot study was conducted among Nurses in Apollo Specialty Hospital Chennai. The subjects were chosen by simple purposive sampling technique, 6 in control group and 6 in experimental group. Level of stress was assessed for both

control group and experimental group. Virtual reality therapy was administered for experimental group for 6 days. There was no intervention for control group. Level of Stress was assessed by using Cohen et al perceived stress scale for both the control and experimental group for 5 days after intervention. Then the level of satisfaction regarding virtual reality therapy was assessed by using rating scale for experimental group. On the whole virtual reality therapy was found to be feasible and acceptable.

### **Ethical Consideration**

- The study was conducted after the approval of ethical committee, Apollo Hospitals, Chennai.
- Obtained permission from Principal, Apollo college of Nursing, HOD of psychiatric Nursing Department and concerned authorities of the hospital.
- The participants were explained about the study and obtained written consent after providing assurance and developing confidence.
- Confidentiality of the data was maintained throughout the study.

### **Intervention Protocol**

Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. Virtual reality is an artificial environment created by software and projected by capturing the user by sensor. The user will be projected in the screen as a disease free user. The person suspends the belief of presence of disease and accepts the real environment. When the brain is preoccupied with virtual environment, it does not perceive other real disease of the patient.

The investigator used the “Kinetic Adventures” for the administration of virtual reality therapy in which the “River Rush” was the selected module as it involves several body movements and enhances the proper functioning of higher mental functions such as attention and concentration.

This in turn helps to improve the confidence and self esteem and thereby reduces the level of anxiety of the participants. In River Rush, one or two players stand in a raft and work together to pick up the adventure pins scattered throughout the winding rapids. The raft is controlled by stepping left or right to steer, and by jumping to jump the raft. There are many secret places that you can get to by taking ramps. There are considerably more adventure points there than on the river. Crashing into barrels, wood, markers, or rapid markers, causes the player to lose points. This intervention is made by the appropriate movements by the individual depending upon to the task designed in the reality therapy. This is given for 5-7 minutes every day for 2 weeks.

### **Data Collection Procedure**

Data collection is gathering information about something which the researcher has chosen to explore or investigate (Polit and Beck, 2012).

The researcher was trained for one week in proceeding virtual reality therapy and was certified before data collection. Permission was obtained from the Principal of the Apollo college of Nursing for conducting the study.

After initial introduction, the researcher obtained consent from the subjects to participate in study. An assurance was given regarding confidentiality before

data collection procedure. Cohen et al perceived stress scale was administered to the participants and their level of stress was assessed in both control and experimental group before the virtual reality therapy intervention. The investigator used the “Kinetic Adventures” for the administration of virtual reality therapy in which the “River Rush” was the selected module as it involves several body movements and enhances the proper functioning of higher mental functions such as attention and concentration. This in turn helps to improve the confidence and self esteem and thereby reduces the level of anxiety of the participants.

In River Rush, one or two players stand in a raft and work together to pick up the adventure pins scattered throughout the winding rapids. The raft is controlled by stepping left or right to steer, and by jumping to jump the raft. There are many secret places that you can get to by taking ramps. There are considerably more adventure points there than on the river. Crashing into barrels, wood, markers, or rapid markers, causes the player to lose points.

The data was collected by using the predetermined and pretested tools such as demographic variable Performa, perceived stress scale by Cohen et al 1983, and level of satisfaction scale. The data collection was done for the period of 5 weeks on selected samples.

Study participants gathered in common recreation hall in the hostel block. Techniques of Virtual Reality Therapy were demonstrated by the researcher and further practiced by the study participants for a period of 1 week. The study participants in experimental group was administered VRT for 5-7 minutes each every day After 2 weeks Stress was assessed by Cohen et al Perceived Stress

Scale both in control and experimental group. Then the level of satisfaction regarding virtual reality therapy was assessed using the satisfaction rating scale on virtual reality therapy. On the whole virtual reality therapy was found to be feasible and effective.

### **Plan for data analysis**

Data analysis is the systematic organization, synthesis of research data and testing of null hypothesis by using obtained data (Polit and Beck, 2012). Analysis and interpretation of data were carried out by using descriptive and inferential statistics.

Descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe the demographic variables & inferential statistics such as 't' test were used to assess the effectiveness of virtual reality therapy on the level of stress by comparing the pre test and post test mean score of stress. Chi square test were used to find out the association between selected demographic variables and level of stress in pre test and post test of control and experimental group of nurses.

### **Summary**

This chapter dealt with the selection of research approach, research design, setting, population, sample and sampling technique, selection and development of study instruments, validity and reliability of the study instruments, pilot study, data collection, procedure and plan for data analysis. The following chapter deals with analysis and interpretation of data using descriptive and inferential statistics.

## **CHAPTER IV**

### **ANALYSIS AND INTERPRETATION**

Analysis is the phase of a study that includes classifying, coding, and tabulating information needed to perform quantitative or qualitative analyses according to the research design and appropriate to the data. Data analysis follows collection of information and precedes its interpretation or application.

This chapter deals with analysis and interpretation including both descriptive and inferential statistics. Statistics is a field of study concerned with techniques or methods of collection of data, classification, summarizing, interpretation, drawing inference, testing of hypothesis, making recommendations etc (Mahajan, 2010).

The data was analyzed according to the objectives and hypothesis of the study. Analysis of the study was compiled after all the data was transferred to the master coding sheet. The investigator used descriptive and inferential statistics for analysis. The data were analyzed, tabulated and interpreted using appropriate descriptive and inferential statistics.

#### **Organization of the findings**

The findings of the study were organized and presented under the following headings.

- Frequency and Percentage Distribution of Demographic Variables in Control and Experimental Group of nurses.
- Frequency and Percentage Distribution of level of Stress Before and After Virtual Reality Therapy in Control and Experimental Group of nurses.

- Frequency and Percentage Distribution of level of Satisfaction regarding Virtual Reality Therapy among Experimental Group of nurses.
- Comparison of Mean and Standard Deviation of Stress Scores between Pre Test and Post Test in Control and Experimental Group of Nurses.
- Association between the Selected Demographic Variables and the Level of Stress Before and After Virtual Reality Therapy in Control and Experimental Group of nurses.

**Table 1 Frequency and Percentage Distribution of Demographic Variables in  
Control and experimental group of Nurses**

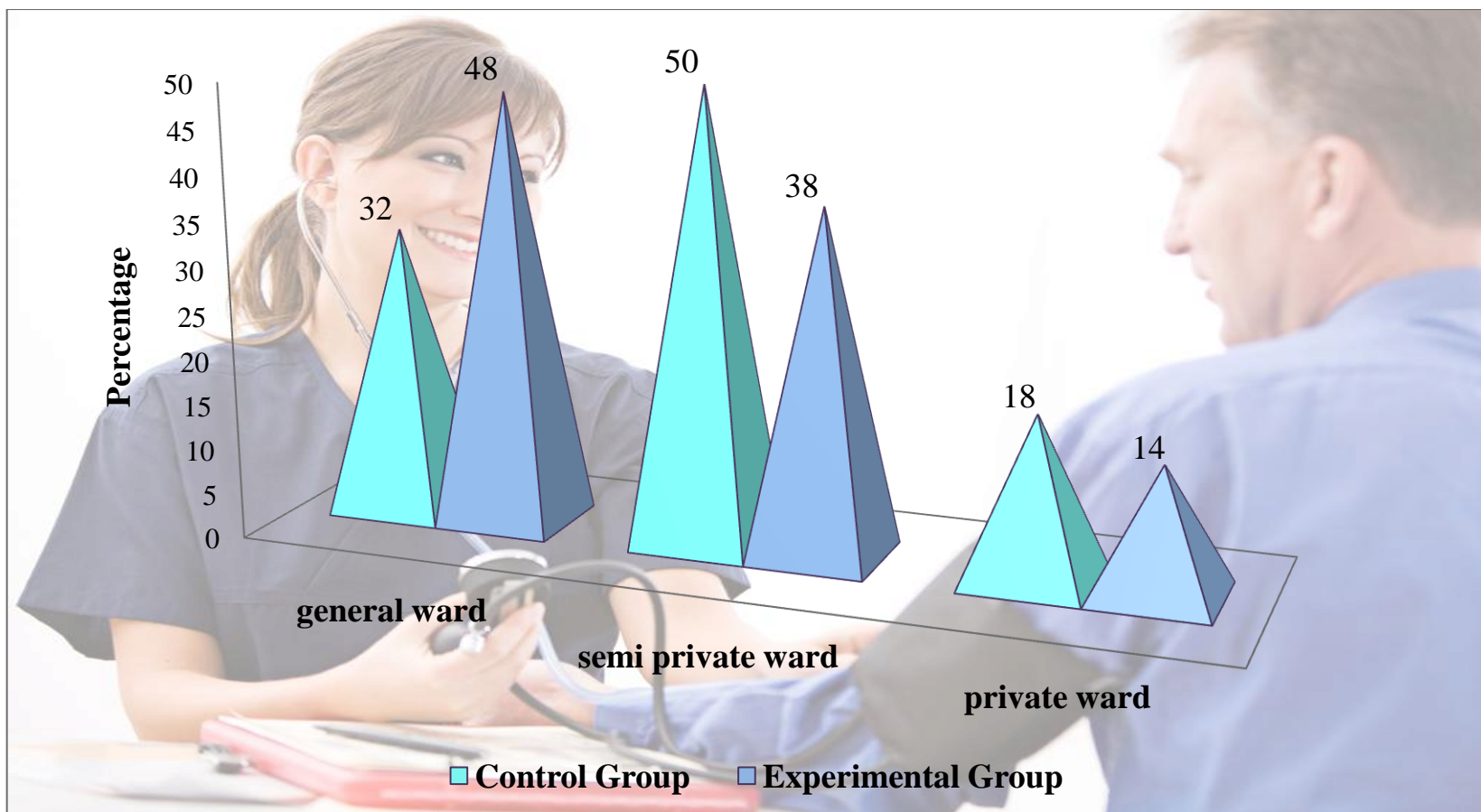
Demographic variables	Control Group (n=30)		Experimental Group (n=30)	
	n	p	n	p
<b>Age in years</b>				
20-25	16	53.3	26	86.6
26-30	8	26.6	4	13.3
31-35	5	16.6	-	-
>35	1	3.3	-	-
<b>Gender</b>				
Male	-	-	-	-
Female	30	100	30	100
<b>Total years of experience</b>				
≤5	18	60	27	90
6-10	12	40	4	13.3
11-15	-	-	-	-
>15	-	-	-	-
<b>Previous knowledge in virtual reality therapy</b>				
Yes	4	13.3	4	13.3
No	26	86.6	26	86.6
<b>Source of information media</b>				
Training program	2	6.6	1	3.3
Literature	5	16.6	3	10
<b>Place of study</b>				
Private	30	100	30	100
Government	-	-	-	-



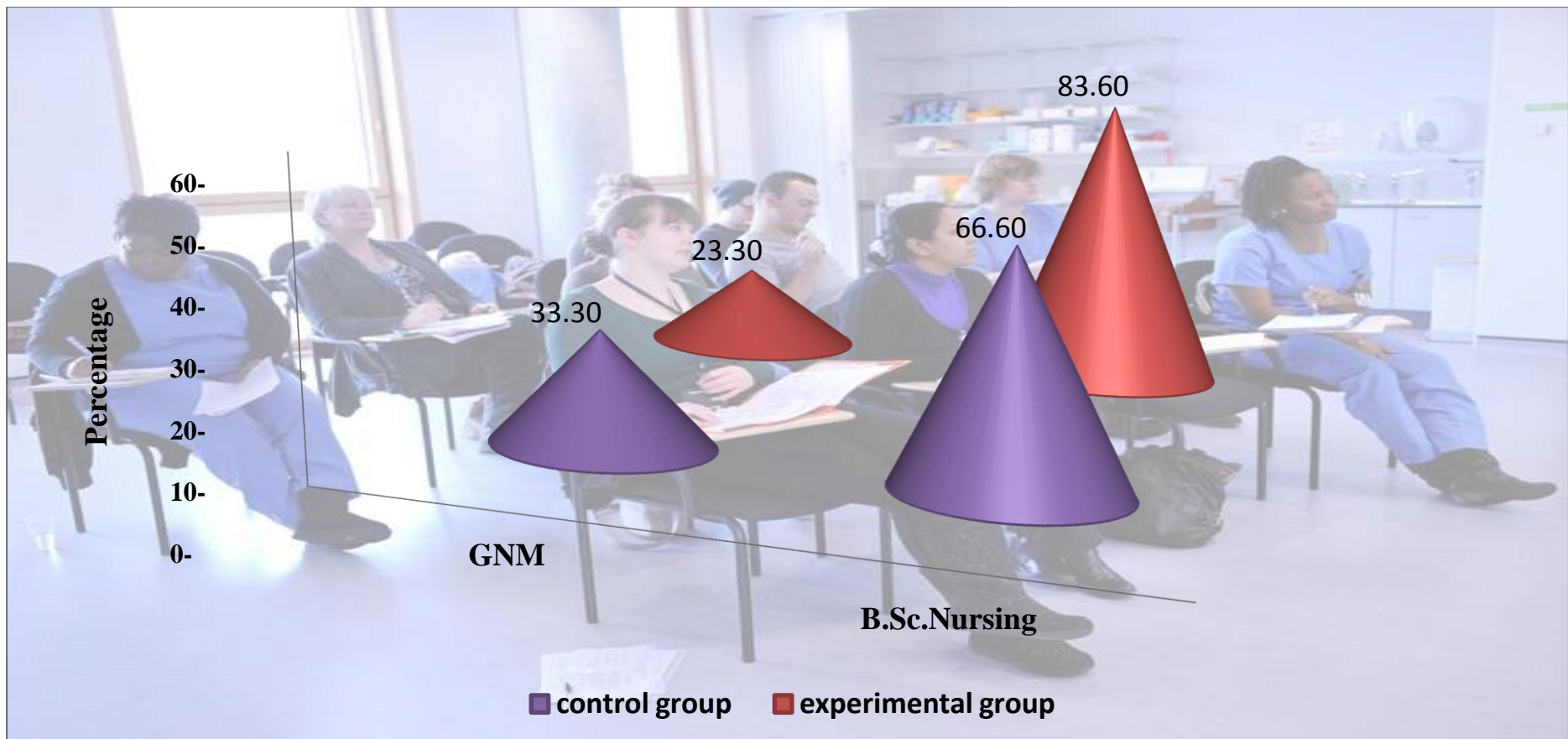
The data in table 1 revealed that Majority of the nurses were aged between 20-25 years (86.6%) with the mean age of 23 years in experimental group, were qualified with B.Sc (N) (66.6%, 86.6%) and had <5 years of experience in control and experimental group respectively. All of the nurses were females (100%, 100%), significant percentage of the nurses had previous knowledge regarding VRT (13.3%,13.3%) and qualified with GNM (33.3%, 23.3%) in control and experimental group respectively. More than half of the nurses were aged between 20-25 yrs (53.3%) in control group.

**Figure 1:** shows significant percentage of them were working in general ward (48%) in experimental group.

**Figure 2:** shows half of them were working in semi private ward (50%) in control group.



**Figure 3: Percentage Distribution of Nurses According to Working Area in Control and Experimental Group**



**Figure 4: Percentage Distribution of Qualification of Nurses in Control and Experimental Group**

**Table 2 Frequency and Percentage Distribution of level of Stress Before and After Virtual Reality Therapy in Control and Experimental Group of nurses.**

Group	Before Therapy						After Therapy					
	Mild		Moderate		Severe		Mild		Moderate		Severe	
	n	p	n	p	n	p	n	p	n	p	n	p
<b>Control Group (n=30)</b>	5	16.6	22	73.3	3	10	12	40	18	60	0	0
<b>Experimental Group (n=30)</b>	0	0	27	90	3	10	24	80	6	20	0	0

The data presented in table 2 depicted that the control group of nurses had the moderate level of stress (73.3%, 60%) in both before and after virtual reality therapy. Whereas among experimental group of the nurses majority (90%) were found having moderate stress before administration of virtual reality therapy. However, after administration of virtual reality therapy majority of them (80%) had mild stress and moderate stress was reduced from 90% to 20%.

**Table 3 Frequency and Percentage Distribution of level of Satisfaction regarding Virtual Reality Therapy among Experimental Group of Nurses**

**n=30**

Level of Satisfaction	Highly Satisfied		Satisfied		Dissatisfied		Highly Dissatisfied	
	n	p	n	p	n	p	n	p
Overall Satisfaction	30	100	-	-	-	-	-	-
Related to Researcher	30	100	-	-	-	-	-	-
Related to Virtual Reality Therapy	30	100	-	-	-	-	-	-

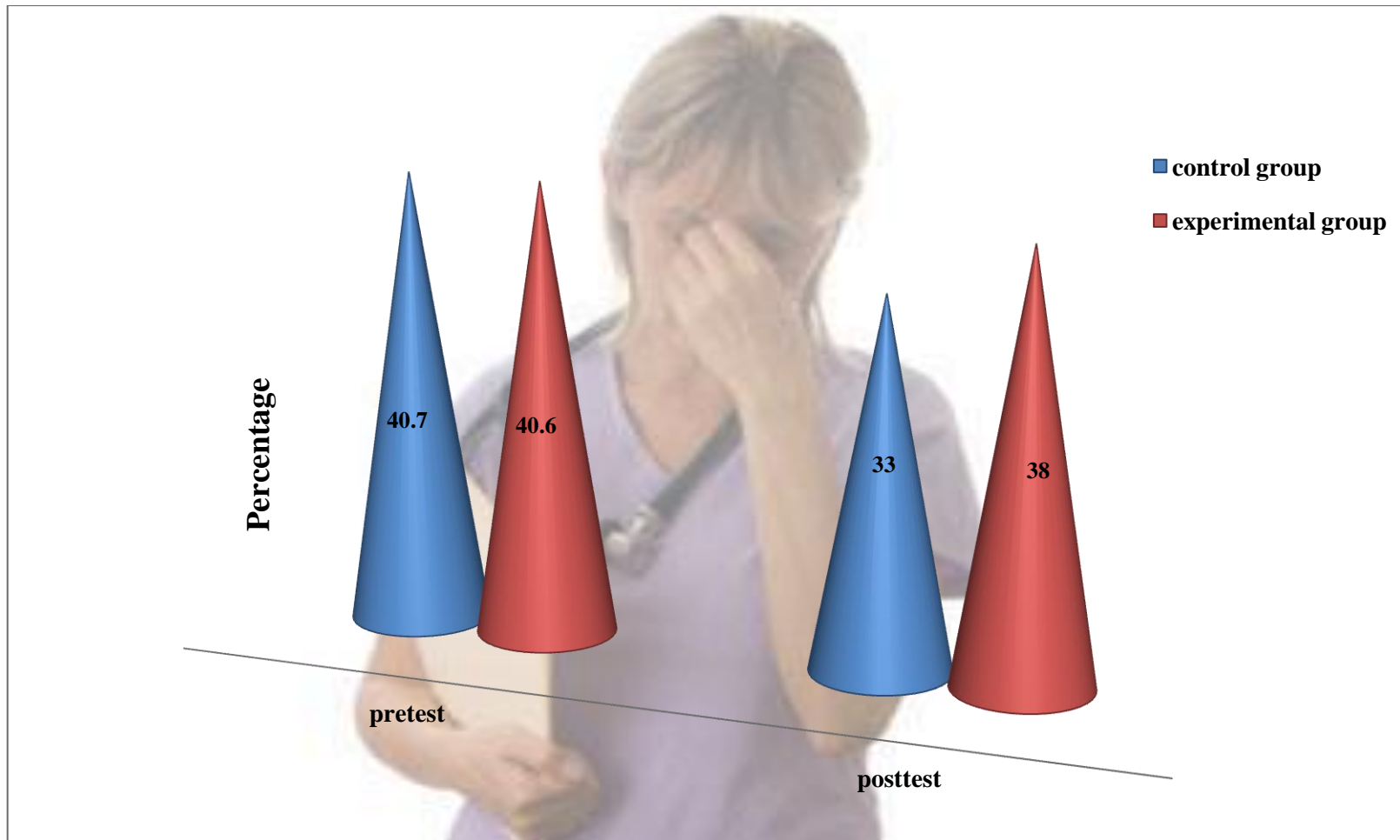
Table 3 indicates that all of the nurses in the experimental group were highly satisfied (100%) with all the aspects of virtual reality therapy.

**Table 4 Comparison of Mean and Standard Deviation of Stress Scores between Pre Test and Post Test in Control and Experimental Group of Nurses.**

Group	Pre-test		t-value	Post-test		t-value
	Mean	SD		Mean	SD	
Control Group (n=30)	40.7	1.9	0.25	33	2.1	8.3***
Experimental Group (n=30)	40.6	2		38	3	

**\*\*\*P<0.001**

The data presented in table 4 depicted that the mean stress score of control group of nurses in pre-test was (M= 40.7, SD= 1.9) and that of post test (M=33, SD= 2.1) in which the difference is not statically significant ( $P>0.05$ ). In experimental group the mean stress score is less in post test (M=38, SD=3) than in pre test (M=40.6, SD=2) which is statistically significant ( $P<0.001$ ). It can be attributed to the effectiveness of Virtual reality therapy on reducing stress. Hence the null hypothesis  $H_0$  is rejected.



**Figure 5: Comparison of Mean of Stress Level in Control and Experimental Group of Nurses**

**Table 5 Association between the Selected Demographic Variables and the Level of Stress Before and After Virtual Reality Therapy in Control Group of Nurses**

**n=30**

Demographic Variables	Before Therapy			After Therapy		
	Above Mean	Up to Mean	$\chi^2$	Above Mean	Up to Mean	$\chi^2$
<b>Age in years</b>						
Up-to 25	0	1	0.85	0	1	0.5
Above 25	10	19	(NS)	7	22	(NS)
<b>Professional qualification</b>						
GNM	9	18	0.98	9	18	0.4
B.Sc	0	3	(NS)	10	2	(NS)
<b>Previous knowledge</b>						
Yes	3	7	0.068	3	7	0.17
No	7	13	(NS)	8	12	(NS)
<b>Working area</b>						
General ward	8	14	0.086	5	14	1.01
Private ward	2	6		5	6	(NS)

**Not significant =1      df = 1**



Table 5 shows that there was no significant association between the selected demographic variables and the level of stress before and after virtual reality therapy in experimental group of nurses. Hence the null hypothesis Ho2 was retained.

**Table 6 Association between the Selected Demographic Variables and the Level of stress before and after Virtual Reality Therapy in Experimental Group of Nurses**

**n=30**

Demographic Variables	Before Therapy			After Therapy		
	Up-to Mean	Above Mean	$\chi^2$	Up-to Mean	Above Mean	$\chi^2$
<b>Age (in Years)</b>						
Up-to 25	10	8	0.08	10	8	2.38
above 25	6	6	(NS)	11	6	(NS)
<b>Professional qualification</b>						
GNM	3	1	0.35	6	1	0.68
Basic	18	8	(NS)	20	6	(NS)
<b>Previous knowledge</b>						
Yes	2	2	0.57	3	1	6.89
No	19	7	(NS)	19	7	(NS)
<b>Working area</b>						
General ward	7	7	4.9***	11	3	0.83
Private ward	14	2		13	3	(NS)

**NS-Not significant    df= 1**

Table 6 shows that There was significant association between the nurses' working area (general ward) and the level of stress in experimental group thus the null hypothesis Ho2 – there will not be any association between the demographic variables and stress is rejected, whereas there is no significant association between other variables like age, gender, professional Qualification, previous knowledge of VRT and stress. Hence the null hypothesis Ho2 –There will not be any significant association between the selected demographic variables like age, gender, professional qualification and previous knowledge and level of stress in experimental group of nurses before and after administration of virtual reality therapy was retained.

### **Summary**

This chapter dealt with analysis and interpretation of data obtained by the researcher. The analysis of the results showed that in experimental group the level of stress have reduced after administration of virtual reality therapy, when compared to before administration of virtual reality therapy. This implied that virtual reality therapy has significant effect on reduction in the level of stress among the experimental group of nurses.

## **CHAPTER V**

### **DISCUSSION**

#### **A Quasi Experimental Study to assess the Effectiveness of Virtual Reality Therapy upon Stress among nurses in Apollo Hospital, Chennai.**

The study was carried out upon 60 nurses at Apollo hospital vanagaram Chennai. The level of stress was assessed before and after virtual reality therapy using perceived stress scale (Cohen et al) in control and experimental group of nurses. Virtual reality therapy was administered for the period of 2 weeks only in the experimental group of nurses. After 2 weeks the level of stress was assessed by using perceived stress scale in control and experimental group of nurses. Then the level of satisfaction on virtual reality therapy was assessed by using rating scale only in experimental group of nurses.

#### **Objectives of the Study**

1. To assess the level of stress in control group & experimental group of nurses before and after administration of virtual reality therapy.
2. To evaluate the effectiveness of virtual reality therapy by comparing the level of stress in control group & experimental group of nurses before and after administration of virtual reality therapy.
3. To determine the level of satisfaction among experimental group of nurses regarding administration of virtual reality therapy.
4. To find out the association between selected demographic variables and the level of stress in control and experimental group of nurses before and after administration of virtual reality therapy.

The discussion is presented under the following headings

- Demographic variables in control and experimental group of nurses.
- Level of stress in control and experimental group of nurses.
- Effectiveness of virtual reality therapy on stress among nurses.
- Association between selected demographic variables and the level of stress before and after virtual reality therapy in control and experimental group of nurses.
- Level of satisfaction regarding virtual reality therapy among experimental group of nurses.

#### **Demographic variables in control and experimental group of nurses**

Majority of the nurses were aged between 20-25 years (86.6%) with the mean age of 23 years in experimental group, were qualified with B.Sc (N) (66.6%, 86.6%) and had <5 years of experience in control and experimental group respectively. All of the nurses were females (100%, 100%), significant percentage of the nurses had previous knowledge regarding VRT (13.3%,13.3%) and qualified with GNM (33.3%, 23.3%) in control and experimental group respectively. More than half of the nurses were aged between 20-25 yrs (53.3%) in control group.

In general, almost all the nurses were in the age group above 23 years, as they were working after completing their Basic or general nursing. Findings show that most of them were not aware of virtual reality therapy (86.6%) in control and Experimental group.

Nurses working in general ward had increased stress level than in private or semi private ward because in general ward the workload and patient assignment is more.

### **Level of stress in control and experimental group of nurses**

Study findings of this study revealed that the nurses had mild stress (16.6%,-), moderate stress (73.3%,90%)and severe stress (10%,10%) in control and experimental group of nurses respectively in pre test. It may be due to work stress such as more responsibilities, workload, hectic and lack of free time in their daily activities.

But however in post test the nurses had mild stress (16.6%,-), moderate stress (73.3%,90%)and severe stress (10%,10%) in control and experimental group of nurses respectively after virtual reality therapy as it helps in reduction of stress level.

Stress has been identified as a 20<sup>th</sup> century disorder and has been viewed as a dynamic transaction between individuals and their environment. Stress can be regarded as a psychological threat, in which the individual perceives a situation as a potential threat (Envas, 2004).

Findings were consistent with study conducted by Jones (1997) in Scotland to assess the level of affective distress, sources of stress and coping strategies in first year student nurses. The method adopted was a comparative study using General Health Questionnaire (30-item version), the Beck and Srivastava Stress Inventory (BSSI) and a modified 'ways of Coping Questionnaire'. The result suggests that 50.5% of students in Cohort 1(n=109,

week 40) and 67.9% of students in Cohort 2 (n=111, week 24) suffered significant affective distress, indicates problem with student distress around an initial series of general/surgical and psycho-social ward placements.

### **Effectiveness of virtual reality therapy on stress among nurses.**

Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. Virtual reality has been proposed as a new way of conducting exposure therapy because it can provide a sense of being present in a feared situation. It permanently registers positive effects in the brain. The difference in mean and standard deviation of stress scores of nurses before virtual reality therapy (M= 32, 32.96, SD= 6.31, 5.20) between control and experimental group was not significant ( $P>0.05$ ). Whereas after virtual reality therapy the difference in the mean and standard deviation (M= 33, 38, SD= 2.1, 3) between control and experimental group of nurses was statistically significant ( $P< 0.001$ ). It can be attributed to the effectiveness of virtual reality therapy on reducing stress.

A study conducted by Anderson et al(2005) also proved the effectiveness of VERT as it revealed reduction on all self-report measures of public-speaking anxiety from pre to post treatment, which were maintained at follow-up (n 58; all  $P <0.05$ ). Participants were no more likely to complete a speech post-treatment than at pre-treatment.

Study findings were consistent with study of Parsons and Albert on their Meta analysis in which they concluded that VERT can reduce anxiety and phobia symptoms. Thomas (2008). Similarly, the four controlled studies showed that VRET is effective in treating acrophobia (Krijin, 2004).

**Association between the selected demographic variables and the level of stress before and after virtual reality therapy in control and experimental group of nurses.**

Chi square test was used to find out the association between selected demographic and the level of stress. It inferred that there was no significant association between the level of stress and the selected variable of control group. Hence the Null Hypothesis Ho2 -There will not be any significant association between the selected demographic variables like age, gender, professional qualification and previous knowledge and level of stress in experimental group of nurses before and after administration of virtual reality therapy was retained.

However there was significant association between the level of stress and the selected variable (working area) of experimental group. Nurses working in general ward experienced more stress than their counter parts who are working in other areas such as semi private, private ward. it may be due to the fact that, nurses in general ward may be overloaded due to shortage of man power. Where the patient and nurse ratio is strictly followed in other critical areas such as ICU, MICU, etc. Hence the Null Hypothesis Ho2 -There will not be any significant association between the selected demographic variables like age, gender, professional qualification and previous knowledge and level of stress in experimental group of nurses before and after administration of virtual reality therapy was rejected.



### **Level of satisfaction regarding virtual reality therapy among experimental group of nurses.**

While planning for any intervention it is important to be aware of the participants, satisfaction on their intervention, so as to gain their cooperation and to continue the intervention even after the completion of the study. Satisfaction arises from a person when a therapy is balanced between the study participants choice and professional responsibility and high level of satisfaction can be obtained when the effects of the therapy are already expected by the nurse.

The researcher found that all nurses were highly satisfied (100%) regarding the intervention of virtual reality therapy. These findings indicated that the administration of virtual reality therapy is effective in reducing the stress level. It is also easy to administer, harmless and cost effective, easy to follow. The ability to imagine one's self in another person's place is very important to social relations and understanding. Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. The above findings give a clear direction to health care professionals that everyone must be paid equal attention with regard to stress and virtual reality therapy should be irrespective of their demographic characteristics.

## **Summary**

This chapter dealt with the objectives of the study, major findings of the demographic variables of nurses with stress, description of severity of stress level before and after administration of virtual reality therapy, mean and standard deviation of stress level before and after virtual reality therapy, association between the selected demographic variables and level of stress of nurses and the level of satisfaction of virtual reality therapy.

**CHAPTER VI**  
**SUMMARY, CONCLUSION, IMPLICATIONS**  
**RECOMMENDATIONS AND LIMITATIONS**

The heart of the study is writing report of the findings. The investigator concise the whole study and made it for future references. This chapter deals with the summary, conclusion, implications and recommendations of the study.

**Summary**

The aim of study was to assess the effectiveness of virtual reality therapy upon stress among nurses.

**Objectives of the Study**

1. To assess the level of stress in control and experimental group of Nurses before and after administration of virtual reality therapy.
2. To evaluate the effectiveness of virtual reality therapy by comparing the level of stress in control and experimental group of Nurses before and after administration of virtual reality therapy.
3. To determine the level of satisfaction among experimental group of Nurses regarding administration of virtual reality therapy.
4. To find out the association between selected demographic variables and the level of stress in control and experimental group of Nurses before and after administration of virtual reality therapy.

The study utilized the experimental study and study was conducted in Apollo hospital Vanagaram Chennai. Sixty nurses were taken through purposive sampling technique. Out of 60 Nurses 30 nurses were assigned to control group and 30 nurses were assigned to experimental group. The stress scores were assessed for both control group and experimental group in both before and after virtual reality therapy.

### **Null Hypotheses**

The null hypotheses stated are,

**Ho1:** There will not be any significant difference in level of stress in control and experimental group of nurses before and after administration of virtual reality therapy.

**Ho2:** There will not be any significant association between selected variables and level of stress in control group and experimental group of nurses before and after administration of virtual reality therapy.

The conceptual framework for this study is based on Betty Neumann model. An extensive review literature and guidance formed foundations to the development of tool. An experimental research approach was used to achieve the objectives of study.

The investigator used demographic variable Performa, perceived stress scale and satisfaction scale for the level of satisfaction of virtual reality therapy to collect the data. The data collection tools were validated and reliability was established. After the pilot study, the data for the main study was collected. The collected data was tabulated and analyzed using descriptive and inferential statistics.

## **Major Findings of the study**

### **Demographic variables in control and experimental group of nurses**

Majority of the nurses were aged between 20-25 years (86.6%) with the mean age of 23 years in experimental group, were qualified with B.Sc (N) (66.6%, 86.6%) and had <5 years of experience in control and experimental group respectively. All of the nurses were females (100%, 100%), significant percentage of the nurses had previous knowledge regarding VRT (13.3%, 13.3%) and qualified with GNM (33.3%, 23.3%) in control and experimental group respectively. More than half of the nurses were aged between 20-25 yrs (53.3%) in control group.

### **Level of stress in control and experimental group of nurses**

Most of them had moderate stress (73.3%, 90%) in control and experimental group of nurses. However in experimental group after virtual reality therapy significant of them had mild level of stress (80%) and (20%) moderate level of stress. Whereas in control group majority of nurses had moderate level of stress (60%) and mild level of stress (40%).

### **Effectiveness of virtual reality therapy on stress among nurses**

The mean stress score of control group of nurses in pre-test was ( $M=40.7$ ,  $SD=1.9$ ) and that of post test ( $M=33$ ,  $SD=2.1$ ) in which the difference is not statically significant ( $P>0.05$ ). In experimental group the mean stress score is lesser in post test than in pre test ( $M=38$ ,  $SD=3$ ) and ( $M=40.6$ ,  $SD=2$ ) which is statistically significant ( $P<0.001$ ). It can be attributed to the effectiveness of Virtual reality therapy on reducing stress. Hence the null hypothesis  $H_01$  is rejected.

### **Association between the selected demographic variables and the level of stress before and after virtual reality therapy in control and experimental group of nurses.**

There was significant association between the nurses' working area (general ward) and the level of stress in experimental group thus the null hypothesis Ho2 – There will not be any significant association between selected variables and level of stress in control group and experimental group of nurses before and after administration of virtual reality therapy was rejected, whereas there was no significant association between other variables like age, gender, professional Qualification, previous knowledge of VRT and stress. Hence the null hypothesis Ho2 – There will not be any significant association between the selected demographic variables like age, gender, professional qualification and previous knowledge and level of stress in experimental group of nurses before and after administration of virtual reality therapy was retained.

### **Level of satisfaction regarding virtual reality therapy among experimental group of nurses**

The researcher found that all of nurses were highly satisfied (100%) regarding the intervention of virtual reality therapy. These findings indicated that the administration of virtual reality therapy is effective in reducing the stress level.

### **Conclusion**

Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. The above findings give a clear direction to health care professionals that everyone must be paid equal attention with regard to stress and virtual reality therapy should be irrespective of

their demographic characteristics. Virtual reality therapy is the non pharmacological, psychosocial intervention for the treatment of stress.

### **Implications**

Based on the findings the researcher recommended the implications on Nursing practice, Nursing administration and Nursing education and Nursing research.

#### **Nursing practice**

The findings of this study revealed that about 90% of nurses had mild level of stress. The study shows that the stress was experienced by nurses irrespective of age, sex, marital status, educational status or any other demographic variables of nurses. This underscores the need for nurses to practice various stress reducing measures including virtual reality therapy daily in their life. Virtual reality therapy is more effective for reducing stress. With emerging health care trends psychiatric nurses must also know about the virtual reality therapy as a part of holistic care concept. This helps the psychiatric nurses to use virtual reality therapy as best therapy and one of the holistic approaches of reducing stress.

#### **Nursing education**

Integration of theory and practice is important in nursing education. With the emerging health trends, nursing education must focus on innovation to enhance nursing care. Some research suggests that occupational stress among health care professional is currently a major concern in health policy including nurses. The research findings suggest that supportive relationships with peers may reduce the occurrence of high stress level among nursing students. Nursing education curriculum should be incorporated with emphasis on stress reduction

and to improve psychosocial work climate in the hospital. The nurses should be taught about the importance of reducing stress to enhance a high quality personal and professional work.

### **Nursing administration**

With technological advances and ever growing challenges of health care, administrators have the responsibility to provide continuing nursing education opportunities to understand the psychosocial intervention including virtual reality therapy.

This enables the nurses to update the knowledge and to render the cost effective care to the public. The nurse administrators must periodically organize formal training program for nurses to reduce stress can be organized by the nurse educators. Nurse administrator can arrange conferences, in service education and workshop to encourage nurses to reduce curriculum related stress and perform well in their work and personal life. Nursing administrators must have measures to allot funds for providing the required instruments to reduce stress as a part of staff welfare program and patient's stress management program.

### **Nursing research**

In India, evidence based clinical strategies are not sufficient to address barriers to reduce the stress. Stress can be categorizes as an antecedent or stimulus as a consequences or response and as an interaction. Nurses to be encouraged to undertake research studies in the area of stress among nursing professionals and to disseminate the findings can be tried for its effectiveness on stress.



### **Recommendations**

- The study can be conducted on larger sample to generalize the results.
- The study can be conducted among the other health care professionals who also experience stress.
- The study can be conducted in community settings among different population like menopausal women and old age population.
- A comparative study can be conducted to evaluate the effectiveness of various other interventions to help the nurses in reducing their stress and to cope up with stress in the day to day life.
- A comparative study can be conducted to assess the level of stress among nurses and other health care professionals.

### **Limitations**

- The study findings cannot be generalized due to small sample population.
- Investigator could not find much published studies on Virtual reality therapy on stress.
- Requirement of an expert for demonstration of the Virtual Reality Therapy.

## REFERENCES

- Admi, H. (1997). **Nursing student's stress during the initial clinical experience.** Journal of nursing education, 36(7), 323 -327.
- Alsina, J. I. (2007) .**Validity of virtual reality as a method of exposure in the treatment of test anxiety.** Journal of Behavioral Research Methods, 39(4), 844-851.
- Anderson, P.L. (2005). **Cognitive behavioral therapy for public-speaking anxiety using virtual reality for exposure, Depress.** Journal of Consulting and Clinical Psychology, 22(3), 156-8. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/16231290>.
- Andreas, J. (2006).**Workload as a determinate of staff injury in intermediate care. International** Journal of occupational Environmental Health, 10(4), 375-382.
- Beck, D. (1999). **Perceived level and sources of stress in baccalaureate nursing students.** Journal of Nursing Education, 30(3), 127-33.
- Behere, P.S. (2011). **A comparative study of stress among students of Medicine, Engineering and Nursing.** Indian journal of psychological medicine, 33(2), 145–148.
- Bonnie, M.J. (2011).**Stressors of critical Nursing.** Journal of American Nursing, 32(2), 75-84.
- Christopher, T.S. (1999). **A retrospective Study to assess the Causes of Stress among Emergency Nurses.** Journal of Advanced Nursing, 22(8), 36-45.
- Daniela Villani (2012). **Is virtual reality always effective stressor for exposure treatments?** Journal of Cyber psychology and Behavior, 15(1), 24-30.

- Ditzel, M.E. (2009). **Job stress among Nurses: the implication for the Health care profession.** *International journal of Behavioral and Healthcare Research*, 1(2), 125-142.
- Envas, W. (2004).**Pre-registration diploma student nurse stress and coping Measures.** *Journal of nurses education today*, 24(6), 473 - 82.
- Frassrand, S. (2005).**A comparative analysis of stress levels in undergraduate university students, published thesis**, University of Tennessee at chaltanooga, school of nursing.
- Hwang, S . L. (2001). **Relationships among stress, physio-psycho-social status, Coping behaviors and personality traits of nursing students during first time clinical Practice.** *Journal in Chinese*, 9(3), 233 - 46.
- Jaye Wald, et al (2006). **Efficacy of virtual reality exposure therapy to treat driving phobia: a case report Original Research Article.** *Journal of Behavior Therapy and Experimental Psychiatry*, 21(3), 249-257. Retrieved From <http://www.ncbi.nlm.nih.gov/pubmed/14583121>.
- John, C.T. (2003). **Work Related Stress among Emergency Nurses, Coping Strategies.** *Journal of Advanced Nursing*, 28(1), 56-62.
- Jones, M. C. (1997). **Distress, stress and coping in first-year student Nurses.** *Journal of Advanced Nursing*, 26(3), 475 - 82.
- Krijin, M. (2004).**Virtual reality exposure therapy of anxiety disorders.** *Journal of clinical psychological review*, 24(3), 259-281.
- Mahajan, B.K. (2010). **Methods in Biostatistics.** 7<sup>th</sup> edition, Jaypee Brothers Medical Publishers.
- Malloy, K. M (2010). **The effectiveness of virtual reality distraction for pain reduction.** *Journal of Clinical Psychology review*, 30(8), 3-9.

- Miyahira, S. D. (2012). **The effectiveness of Virtual reality exposure therapy for PTSD in returning war fighters.** Journal of health technology and informatics, 181(2), 128-132.
- Nicholl, H. (2005). Programme **related stressors among part time undergraduate nursing students.** Journal of advanced nursing, 50(1), 93-100.
- North, M.M. (2003). **Virtual reality therapy in aid of senior citizens psychological disorders.** Journal of health technology and informatics, 94(2), 245-247.
- Page L. Anderson (2005). **Cognitive behavioral therapy for public speaking anxiety using Virtual reality for exposure.** Journal of depression and anxiety, 22(3), 156-158.
- Piko, B. (2000). **Work Related Stress among Nurses: a Challenge for Health Care Institution.** International Journal of Behavioral and Healthcare Research, 20(2), 76-82.
- Polit, D.F & Beck, C.T (2008). **Nursing Research generating and assessing evidence for nursing practice.** 8<sup>th</sup> edition, New Delhi Lippincott Williams and Wilkins.
- Powers, M. B. (2013). **Do conversations with virtual avatars increase feelings of social anxiety.** Journal of Anxiety Disorders, 27(2), 398-493.
- Robillard, G. (2003). **Anxiety and presence during virtual reality immersion: a comparative study of reactions of phobic and non-phobic participants in therapeutic virtual environments derived from computer games.** Journal of Cyber psychology and Behaviour, 6(5), 467-476.

- Rothbaum, B.O (2007). **Virtual reality exposure therapy**. Journal of Psychotherapy, 6(3), 219-26.
- Sayed, F. N. (2007). **Experienced stressors and coping strategies among Iranian nursing students**. Journal for nurses, 13(1), 11 - 6.
- Schneider, SM. (2003). **Virtual reality intervention for older women with breast cancer**. Journal of Cyber psychology& behavior, 6(3), 301-307.
- Schneider, SM. (2004). **Virtual reality as a distraction intervention for women receiving chemotherapy**. Journal of Cyber psychology& behavior, 31(1), 81-88.
- Severinsson, E. (2003). **Moral stress and burnout: qualitative content analysis**. Journal of nursing health science, 5(1), 59-66.
- Sluiter (2003). **Work stress and burnout in Emergency nurses**. Journal of Critical Care Nursing, 22(3), 72-78.
- Thomas, D. (2008). **Affective outcomes of virtual reality exposure therapy for anxiety specific phobias: a meta- analysis**. Journal of Behavioral therapy and experimental psychiatry, 39(1), 250-261.
- Townsend (2010). **Psychiatric Mental Health Nursing**. 6<sup>th</sup> edition, Jaypee Brothers Medical Publishers.
- Trockel ,M. (2000). **Health-related variables and academic performance among first-year college students: Implications for sleep and other behaviors**. Journal of American College Health, 49(3), 125-132.
- Van, D.T. (2008). **Managing Job stress in Nursing: what kind of resource do we need?** Journal of Advanced Nursing, 63(1), 75-84.

Wallach, H. S. (2011). **Virtual reality exposure versus cognitive restructuring for treatment of public speaking anxiety: a pilot study.** Israel Journal of Psychiatry and Related Sciences, 48(2), 91-97.

Yang (2011).**Work place adjustment and stress among nurses.** American Journal of Nursing, 18(1), 7-13.

## APPENDIX – I

### LETTER SEEKING PERMISSION TO CONDUCT THE STUDY



(A unit of Apollo Hospitals Educational Trust)

(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/093/14

08.02.2014

To

The Nursing Superintendent  
Apollo Specialty Hospital  
No.320, Anna Salai  
Vanagaram  
Chennai – 600 035.

Dear Madam,


Sub.: To request permission for research study – Reg.

**Greetings!** As part of the curriculum requirement our 2<sup>nd</sup> year M.Sc. (N) student Ms.Yuvarani.B has selected the following title for her research study.

**“A quasi experimental study to assess the effectiveness of virtual reality therapy upon stress among nurses at Apollo Hospital, Chennai**

So I kindly request your good selves to permit her to conduct study in your esteemed hospital.

Thanking you,

  
**Dr. LATHA VENKATESAN**

**PRINCIPAL**

Regd. Office : 21, Greaves Lane Off, Greaves Road, Chennai - 600 006. Ph. : +91-44-2829 3333, 2829 0200 Website : [www.apollohospitalseducation.com](http://www.apollohospitalseducation.com)  
Unit Office : Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095. Phone : 044 - 2653 4387 Fax : 044 - 2653 4923 / 2653 4386



Emergency Service  
Dial **1066**



## LETTER PERMITTING TO CONDUCT THE STUDY



**Apollo College of Nursing**  
(A unit of Apollo Hospitals Educational Trust)

(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/089/14

08.02.2014

To

The Medical Superintendent  
Apollo First Med Hospital  
Ponamalle high road,  
Chennai – 600 010

Dear Madam,

**Sub.:** To request permission for research study – Reg.

As part of the curriculum requirement our 2<sup>nd</sup> year M.Sc. (N) student Ms. Shekinah Doris has selected the following title for her research study.

**“A Quasi Experimental Study to Assess the Effectiveness of Virtual Reality Therapy Upon Stress among Nurses in Selected Hospital Chennai.”**

So I kindly request your good selves to permit her to conduct study in your esteemed hospital.

Thanking you,

*Antel*  
**Dr. LATHA VENKATESAN**  
**PRINCIPAL**

*T. Mani - M.D. Nursing  
OK - Standing the program this in*  
*5/5/14*  
**Dr. K.C. Krishnakum**  
**Asst. DMS**

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Emergency Service  
Dial **1066**





## APPENDIX – II

### ETHICAL COMMITTEE LETTER

## Ethics Committee



09 April, 2014

To,  
Ms. Shekinah Doris.J.D  
2nd Year M.SC (Nursing),  
Department of Pediatric Nursing,  
Apollo College of Nursing, Chennai.

**Ref:** An experimental study to assess the effectiveness of virtual reality therapy upon stress among nurses at selected Hospitals, Chennai

**Sub:** Approval of the above referenced project and its related documents.

Dear Ms. Shekinah Doris. J. D,

Ethics Committee-Apollo Hospitals has received the following document submitted by you related to the conduct of the above-referenced study.

- Project Proposal
- Informed Consent Form

The Ethics Committee-Apollo Hospitals reviewed and discussed the Project proposal documents submitted by you related to the conduct of the above referenced Project at its meeting held on 08 April, 2014.

The following Ethics Committee Members were present at the meeting held on 08 April, 2014

Name	Gender	Designation	Affiliation	Position in the committee
Dr. P. Nalini Rao	F	Independent Consultant, Social Research and development	Madras School of Social Work, Chennai	Chairperson (Social Scientist)
Dr. Rema Menon	F	Blood Bank Officer	Apollo Hospitals, Chennai	Member Secretary (Clinician)
Dr.Muralidaran	M	Professor & Head, Department of Pharmacology	BaidMetha College of Pharmacy, Chennai	EC-Member (Pharmacologist)
Mrs. Mathanghi	F	Executive- project	Apollo Pharmacy, Chennai	EC-Member (Layperson)
Mr. Philip.T.Paul	M	Lawyer	Madras High Court, Chennai	EC-Member (Lawyer)

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## ETHICAL COMMITTEE LETTER

### Ethics Committee



Dr. K. Sathyamurthi	M	Asst. Professor	School of Social work, Chennai	EC-Member (Social Scientist)
Dr. VijayaKumar Chockan	M	Medical Superintendent	Apollo Speciality Hospitals, Chennai	EC-Member (Clinician)
Dr. K. C. Krishnakumar	M	Medical Superintendent	Apollo First Med Hospitals, Chennai	EC-Member (Clinician)

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The EC review and approval of the report is only to meet the academic requirement and will not amount to any approval of the conclusions / recommendations as conclusive, deserving adoption and implementation, in any form, in any healthcare institution.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

With Regards,

Date: 09/04/14

  
Dr. Rema Menon,  
Ethics Committee-Member Secretary,  
Apollo Hospitals, Chennai,  
Tamil Nadu, India.

Dr. REMA MENON  
MEMBER SECRETARY  
ETHICS COMMITTEE  
APOLLO HOSPITALS  
CHENNAI-600 006, TAMILNADU

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21, Greams Lane, Off Greams Road, Chennai - 600 006  
Tel : 91 - 44 - 2829 1618, 2829 3333, 91 - 44 - 2829 5465 Extn : 5045 / 6641  
Fax : 91 - 44 - 2829 1618 / 4449 E - Mail : [ecapollochennai@gmail.com](mailto:ecapollochennai@gmail.com)

## APPENDIX – III

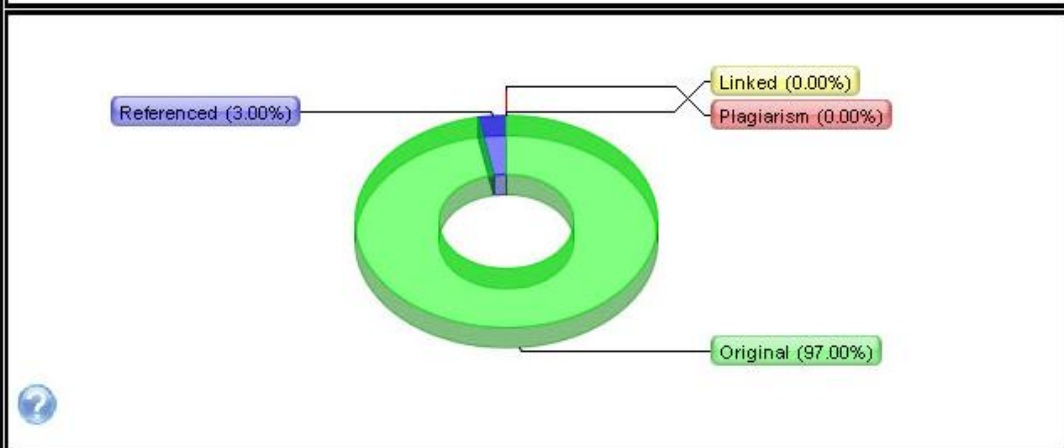
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Generation Time and Date:	18/01/2015 04:29:40
Document Name:	SHEKINAH DORIS THESIS-1.docx
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## APPENDIX – IV

### LETTER SEEKING PERMISSION TO USE STUDY TOOL

1/21/2015

Gmail - Permission request



shekinah doris <shekinahdoris89@gmail.com>

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#### Permission request

3 messages

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shekinah doris <shekinahdoris89@gmail.com>  
To: conser@andrew.cmu.edu

Mon, May 5, 2014 at 10:13 PM

Respected sir,

I am Shekinah doing my II year M.Sc nursing in Apollo College of Nursing, Chennai. As a part of our curriculum the following title has been selected for my study,

" An Quasi Experimental study to assess the effectiveness of Virtual Reality Therapy upon Stress among Nurses at selected Hospitals, Chennai"

Sir i have keen interest to use your Perceived stress scale in my research study, so i kindly request you to permit me to use the scale for my study.

Thanking You,

Yours faithfully,  
Shekinah,  
II year M.Sc nursing  
Apollo college of Nursing  
Chennai  
India.

---

conser <conser@andrew.cmu.edu>  
To: shekinah doris <shekinahdoris89@gmail.com>

Mon, May 5, 2014 at 10:53 PM

Dear Shekinah,

Dr. Cohen is glad to allow you to use the PSS at no cost for your nursing research study. He always grants permission at no cost for nonprofit educational purposes such as your Nursing research project.

May your study proceed smoothly.

Sincerely,

Ellen Conser  
Assistant to Dr. Sheldon Cohen  
Department of Psychology  
Carnegie Mellon University  
[Quoted text hidden]

## **APPENDIX – V**

### **LETTER SEEKING PERMISSION FOR CONTENT VALIDITY**

**From**

Ms. Shekinah Doris  
M.Sc., (Nursing) II Year,  
Apollo College of Nursing,  
Chennai-95.

**To**

Through Proper channel  
Dr. Latha Venkatesan,  
Principal,  
Apollo College of Nursing.

**Sub:** Request for opinions and suggestions of experts for content validity of Research tool.

**Respected Sir/ Madam**

Greetings! As a part of the Curriculum Requirement the following research title is selected for the study. **“A Quasi Experimental Study to Assess the Effectiveness of Virtual Reality Therapy upon Stress among nurses at Apollo Hospital, Chennai”**.

I will be highly privileged to have your valuable suggestions with regard to the establishment of Content Validity of Research tool. So, I request you to validate my Research tool and give suggestions about the tool.

Thanking You,

Date:

Yours Sincerely,

Place:

(Ms. Shekinah Doris)

## **APPENDIX – VI**

### **CONTENT VALIDITY CERTIFICATE**

I hereby certify that I have validated the Research tool and interventional programme of Ms. Shekinah Doris M.Sc. (N) II year student who is undertaking research study. **“A Quasi Experimental Study to Assess the Effectiveness of Virtual Reality Therapy upon Stress among nurses at Apollo Hospital, Chennai”.**

Signature of Expert

Name and designation

## **APPENDIX – VII**

### **LIST OF EXPERTS FOR CONTENT VALIDITY**

1. **Dr. Latha Venkatesan,**  
**M.Sc., (N), M.Phil., Ph.D., (N)**  
Principal & Professor in Nursing,  
Apollo College of Nursing,  
Chennai-600095.
2. **Mrs. Lizy Sonia. A,**  
**M.Sc., (N), Ph.D., (N)**  
Vice Principal & Professor in Nursing,  
Apollo College of Nursing,  
Chennai-95.
3. **Dr. K. Raman**  
MBBS, MD, DFCAP.,  
Psychiatric consultant  
Apollo Hospitals  
Chennai – 600095.
4. **Prof. K.Vijayalakshmi,**  
**M.Sc., (N), M.A. (Psychology), Ph.D., (N),**  
H.O.D, Department of Mental Health Nursing,  
Apollo College of Nursing, Chennai.
5. **Mrs. Anuradha. C., M.Sc., (N), M.Sc. Psychology,**  
Reader,  
Department of Mental Health Nursing,  
Apollo College of Nursing, Chennai.
6. **Mrs. Stella Mary. I, M.Sc., (N)**  
Reader,  
Department of Mental Health Nursing,  
Apollo College of Nursing, Chennai.

## APPENDIX - VIII

### RESEARCH PARTICIPANT CONSENT FORM

Dear participant,

I am M.Sc (N) II year student of Apollo College of Nursing. As a part of my study, a research study on **“A Quasi Experimental Study to assess the Effectiveness of Virtual Reality Therapy upon Stress among nurses at Apollo Hospital, Chennai”**.

The findings of the study will be helpful in reducing the stress in nursing students. I hereby seek your consent and cooperation to participate in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

I ..... hereby consent to participate and undergo the Study.

Place:

Date:

Signature of the Participant



## APPENDIX – IX



### Medical Advance Research Foundation

(Public Charitable Trust)

Recipient : Science Popularisation Award, Government of Tamil Nadu 2001 - 2002

Managing Trustee :

**Dr. M. KUMARESAN**, M.S. (E.N.T.) D.L.O.

MEMBER, POLITZER SOCIETY, USA

President, Madras - India Regional Chapter of the Acoustical Society of America

Secretary, Acoustical Foundation Education and Charitable Trust

Director, International Research Institute for the Deaf.

RECIPIENT OF NATIONAL AND STATE GOVERNMENT AWARDS

Managing Director, Bharath Institute of Para-Medical Sciences

Chairman, Bharath Community College.

Office :

**SIVA E.N.T. HOSPITAL**

No.159, Arvai Shanmugam Salai,  
Royapettah, Chennai - 600 014.

Tamil Nadu, India.

Phone : 2811 6807

E-mail : kumaresan@doctor.com

Cell : 98410 55774

Research :

**Virtual Reality Medicine**

Date : 08/05/2014



### Certificate Of Virtual Reality Therapy Completion

This is to Certify Miss.J.D.Shekinah Doris Msc.Nursing II year  
has Successfully Completed the Training for Virtual Reality  
Therapy ; Aim, Target People, Methodology, outcome Conducted  
from 30/04/2014 to 02/05/2014

  
Dr. KUMARESAN, M.S., D.L.O.  
Managing Director  
SIVA E N T. HOSPITAL (PVT) LTD  
94, LLOYDS ROAD,  
MADRAS 600 014  
PHONE: 8260485

## **APPENDIX – X**

### **APPENDIX X**

#### **CERTIFICATE FOR ENGLISH EDITING**

#### **TO WHOM SO EVER IT MAY CONCERN**

This is to certify that the dissertation “**A Quasi Experimental Study to Assess the Effectiveness of Virtual Reality Therapy upon Stress among Nurses at Apollo Hospital, Chennai.**” By Ms. Shekinah Doris, II-year M.Sc. (N) Student, Apollo College of Nursing, was edited for English language appropriateness.

*Jeevananth P.*  
Signature

**PRINCIPAL**

**C.S.I. Bain Matriculation School,  
Kodungaiyur, Chennai-600 118.**

## APPENDIX – XI

### Demographic Variable Performa for nurses

#### Purpose

This Performa is used to measure the demographic variables such as age, gender, total years of experience, professional qualification, designation, working area, place of study.

#### Instruction

The researcher collects the following information from the participants by asking questions in the interview form. Please be frank and free to answer, it will be kept confidential and anonymity will be maintained.

**1. Sample no:** \_\_\_\_\_

**2. Age in years**

2.1.20-25 ☐

2.2 26-30 ☐

2.3 31-35 ☐

2.4 > 35 ☐

**3. Gender**

3.1 Male ☐

3.2 Female ☐

**4. Total years of Experience**

4.1 5-10 years ☐

4.2 6-10 years ☐

4.3 11-15 years ☐

4.4 >15 years ☐

**5. Professional qualification**

5.1 GNM ☐

5.2 B.Sc(N) ☐

5.3 P.B.B.Sc(N) ☐

**6. Previous knowledge on virtual reality therapy**

6.1 Yes ☐

6.2 No ☐

**7. If yes what was the source of information?**

7.1 Media ☐

7.2 Training program ☐

7.3 Lecture ☐

**8. Working area**

8.1 General ward ☐

8.2 Semi private ward ☐

8.3 Private ward ☐

**9. Place of study**

9.1 Private ☐

9.2 Government ☐

## APPENDIX – XII

### PERCIEVED STRESS SCALE

#### Sheldon Cohen

The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress.

#### Instructions

The researcher interviews the participants about their feelings and thought during the last month and tick the appropriate answer in the column/box.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

S.NO	Item	0	1	2	3	4
1.	How often have you been upset because of something that happened unexpectedly?					
2.	How often have you felt nervous and “stressed”?					
3.	How often have you felt that you were unable to control the important things in life?					
4.	How often have you dealt successfully with irritating life?					
5.	How often have you felt that you were effectively coping with important changes that were occurring in your life?					

6.	How often have you felt confident about your ability to handle your personal problem?					
7.	How often felt that things were going your way?					
8.	How often have you found that you could not cope With all the things that you had to do?					
9.	How often have you been able to control irritation in your life?					
10.	How often have you felt that you were on top of the things?					
11.	How often have you been angered because of things that were outside your control?					
12.	How often you have found yourself thinking about things that you have to accomplish?					
13.	How often have you been able to control the way you spend your time?					
14.	How often have you felt difficulties were piling up so high that you could not overcome them?					

**Scoring:**

Scores are obtained by reversing the scores on the seven positive items,

e.g. 0= 4, 1=3, 2=2 and then summing across all 14 items 4, 5, 6, 7, 9, 10 and 13

are

the positively stated items.

$\leq 27$ - mild

28-41- Moderate

$>41$  – Severe

## APPENDIX – XIII

### RATING SCALE ON THE LEVEL OF SATISFACTION OF VIRTUAL REALITY THERAPY

#### Purpose

This rating scale is used to assess the level of satisfaction of the participants regarding virtual reality therapy.

#### Instructions

Please keep your frank responses to the questions given below. The information will be kept confidentially and will be used for research purpose only.

S. No	Item	Highly satisfied 4	Satisfied 3	Dissatisfied 2	Highly Dissatisfied 1
1.	I feel more comfortable about Virtual reality therapy.				
2.	Duration of Virtual reality therapy is sufficient for me.				
3.	I like to do it regularly.				
4.	It improves my self image.				
5.	I experienced decrease in mental stress.				
6.	My mind is relaxed after Virtual reality therapy.				



7.	It improves my inner feelings and peace of mind.				
8.	I am able to cope up with stress efficiently				
9.	The researcher explained clearly about the intervention				
10.	The researcher cleared all the doubts I had about intervention				
11.	I am satisfied with the manner of demonstration				
12.	The researcher was present throughout the procedure				

### Scoring

#### Score Percentage Level of satisfaction

≥ 36 76-100% Highly satisfied

23-35 51-75% Satisfied

11-22 25-50% Dissatisfied

1-10 Below 25% Highly Dissatisfied

**APPENDIX – XIV**

**BLUE PRINT FOR LEVEL OF SATISFACTION ON**

**VIRTUAL REALITY THERAPY**

<b>S.No</b>	<b>Content</b>	<b>Item No</b>	<b>Total No of items</b>	<b>Percentage</b>
1.	Virtual Reality Therapy	1,2,3,4	4	33.3%
2.	Outcome of Virtual reality therapy	5,6,7,8	4	33.3%
3.	Researcher's approach	9.10.11.12	4	33.3%

## **APPENDIX – XV**

### **CONTENT OF VIRTUAL REALITY THERAPY**

<b>TOPIC</b>	:	Virtual Reality Therapy
<b>GROUP</b>	:	Nurses
<b>PLACE</b>	:	Apollo Hospital, chennai
<b>DURATION</b>	:	60 minute
<b>METHOD OF TEACHING:</b>		Lecture and demonstration,
<b>EDUCATOR</b>	:	II year M.Sc., (N) Student, Apollo College of Nursing, Chennai

#### **OBJECTIVES**

At the end of session the nurses will be able to,

- explain what is Virtual reality therapy
- Justify the need for Virtual reality therapy among nurses
- practice virtual reality therapy
- ventilate their feelings during virtual reality therapy
- demonstrate stress reducing exercises

SPECIFIC OBJECTIVES	CONTENT	LEARNING ACTIVITIES
introduce the topic	<p style="text-align: center;"><b>INTRODUCTION</b></p> <p>Stress is inevitable nowadays; Stress affects the physical, mental and social wellbeing of a person.</p> <p>Virtual reality is a technique that allows a person to participate actively in a sense of being present in the virtual environment. Virtual reality has been proposed as a new way of conducting exposure therapy because it can provide a sense of being present in a feared situation. This method appears to have several advantages over standard exposure therapy.</p> <p>Virtual is artificial and reality is what we experience. The field of Virtual reality is growing rapidly due to recent advances in artificial intelligence and computer graphics. It has been believed that artificial intelligence can help to improve human health and quality of life.</p> <p>Virtual reality was invented by Morton H. Eilig in 1956. Virtual reality was introduced in Medicine by Dr. Ralph Larson in the year 1990. He introduced virtual reality in medicine to treat his own fear of height (Acrophobia).</p> <p>At present virtual reality is being used as part of treatment. Prof. V.S.Ramachandran from the university of California is noted for his use of virtual reality and the neuron imaging – mirror neuron.</p>	Listening

<p>Justify the nature of Virtual reality therapy.</p>	<p style="text-align: center;"><b>NATURE OF THE VIRTUAL REALITY THERAPY</b></p> <p>Virtual reality is a form of technology which creates computer generated worlds or immersive environment, which people can interact with it. Virtual is artificial and reality is what we experience.</p> <p>So, the term virtual reality basically means “Near Reality”</p> <p>Virtual reality treatment refers to immersive, interactive, multisensory, viewer- centred, sensor, projector viewed theatre environment which can be explored and interacted with by a person. The person becomes part of this virtual world or is immersed within this therapeutic environment and whilst, they will be able to manipulate objects or perform a series of actions displayed on the screen.</p> <p>Thereby the person feels relief from his problems by permanently registering the positive effects in the brain. Virtual reality therapy is the simulation of physical presence in the real or imaginary world. Seeing the world through different eyes.</p>	<p>Listening</p>
<p>list down the aims of Virtual Reality Therapy</p>	<p style="text-align: center;"><b>AIMS OF VIRTUAL REALITY THERAPY</b></p> <ul style="list-style-type: none"> <li>➤ To promote and protect people’s help throughout their lives.</li> <li>➤ To reduce the incidence of major diseases and injuries and to alleviate the suffering.</li> </ul> <p style="text-align: center;"><b>USES OF VIRTUAL REALITY THERAPY</b></p> <ul style="list-style-type: none"> <li>➤ The virtual reality therapy is often used to help patients face and overcome insomnia.</li> </ul>	<p>Listening</p>





Virtual reality Therapy	<p>training and breathing exercises are often used adjunctively to cognitive techniques to provide anxious individual with a skill to decrease symptoms of over arousal.</p>	
explain deep breathing exercise	<p><b>DEEP BREATHING EXERCISE</b></p> <p>In deep breathing exercise, elderly population is asked to sit erect, with head straight, palms on the lap and feet placed on the floor, one foot apart. She is instructed to breathe in slowly for 4 counts (4sec) and breathe out gradually for 6 counts (6sec).</p> <p>This is repeated 5times with the eyes opened and 5 times with the eyes closed. Breathing in and breathing out should be gradual without any jerks and there should not be any tension on the chest and shoulders.</p>	Listening
explain the virtual reality play station	<p><b>VIRTUAL REALITY PLAY STATION</b></p> <p>Virtual reality is an artificial environment created by software and projected by capturing the user by sensor. The user will be projected in the screen as a disease free user. The person suspends the belief of presence of disease and accepts the real environment. When the brain is preoccupied with virtual environment, it does not perceive other stimuli as effective as it otherwise good. This mechanism in turn, greatly lessens the sensation of real disease of the patient.</p> <p>The virtual reality replicates real life situation. Even though it may look like a game, but what we are doing is giving a very scientific prescription to rehabilitate you. The real time</p>	Listening



<p>list the benefits of Virtual Reality Therapy</p>	<p>behaviours motions are captured by the sensor plug into the presentation media for creating rehabilitation applications.</p> <p><b>BENEFITS OF VIRTUAL REALITY THERAPY</b></p> <ul style="list-style-type: none"> <li>➤ Virtual reality stimulates sleep</li> <li>➤ Improve memory</li> <li>➤ Improve concentration</li> <li>➤ Reduce insomnia</li> <li>➤ Improve sleep during night time</li> <li>➤ Improve language skills</li> <li>➤ Improve creative thought</li> <li>➤ Improve cognitive skills</li> <li>➤ Improve decision making</li> <li>➤ Improves self esteem</li> <li>➤ Lose weight</li> <li>➤ Good Physical Exercises</li> </ul>	<p>Listening</p>
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	<p><b>CONCLUSION</b></p> <p>Virtual reality is a new way of conducting exposure therapy because it can provide a sense of being present in a feared situation. It stimulates the physical presence in real or imaginary world.</p> <p>More specially designed environments with user friendly atmosphere can be created which allow for broader virtual reality usage in treatment and research. This can be done in monitored, controlled, censored, projector viewed theatre environment, tailored to the needs of each individual patient. It permanently registers positive effects in the brain.</p>	
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## **APPENDIX - XVI**

### **DATA CODE SHEET**

#### **DEMOGRAPHIC VARIABLE PROFORMA OF STAFF NURSES**

Sample no:

**1. AGE-Age in years**

1.1 20-25

1.2 26-30

1.3 31-35

1.4 >35

**2. GEN-GENDER**

2.1 Male

2.2 Female

**3. TYE-TOTAL YEARS OF EXPERIENCE**

3.1 <5

3.2 6-10

3.3 11-15

3.4 >15

**4. PO- PROFESSIONAL QUALIFICATION**

4.1 G.N.M

4.2 B.sc

4.3 P.B.B.sc

**5. PKIVRT-PREVIOUS KNOWLEDGE IN VIRTUAL REALITY THERAPY**

5.1 Yes

5.2 No

**6. SIM-SOURCE OF INFORMATION MEDIA**

6.1 Media

6.2 Training program

6.3 Literature

**7. WA-WORKING AREA**

7.1 General ward

7.2 Semi Private ward

7.3 private ward

**8. POS- PLACE OF STUDY**

8.1 Private

8.2 Government

**APPENDIX - XVII**  
**MASTER CODE SHEET**  
**CONTROL GROUP**

Demographic variables							STRSS SCORE	
AGE	GEN	TYE	PQ	PKIVRT	WA	POS	PRE TEST	POST TEST
1.1	2.1	3.1	4.1	5.2	7.1	8.1	40	40
1.1	2.1	3.1	4.1	5.2	7.1	8.1	38	38
1.1	2.1	3.1	4.2	5.2	7.1	8.1	36	38
1.1	2.2	3.1	4.2	5.2	7.2	8.1	37	37
1.1	2.2	3.1	4.2	5.2	7.2	8.1	42	40
1.1	2.1	3.1	4.2	5.2	7.2	8.1	37	39
1.2	2.1	3.2	4.2	5.2	7.1	8.1	37	37
1.2	2.1	3.2	4.2	5.2	7.3	8.1	44	44
1.3	2.2	3.2	4.2	5.1	7.1	8.1	38	38
1.1	2.1	3.1	4.2	5.1	7.3	8.1	38	36
1.2	2.1	3.2	4.2	5.2	7.1	8.1	37	36
1.1	2.1	3.1	4.1	5.2	7.3	8.1	33	30
1.3	2.1	3.2	4.2	5.2	7.1	8.1	36	36
1.1	2.1	3.1	4.2	5.2	7.3	8.1	40	40
1.2	2.1	3.2	4.2	5.2	7.2	8.1	42	44
1.3	2.1	3.2	4.2	5.1	7.2	8.1	41	40
1.2	2.2	3.2	4.2	5.2	7.3	8.1	38	38
1.2	2.1	3.2	4.2	5.2	7.3	8.1	36	38
1.1	2.1	3.1	4.2	5.2	7.1	8.1	36	36
1.1	2.1	3.1	4.1	5.2	7.3	8.1	30	32
1.1	2.1	3.2	4.2	5.2	7.3	8.1	31	30
1.2	2.1	3.2	4.2	5.2	7.2	8.1	41	41
1.1	2.1	3.1	4.2	5.2	7.1	8.1	43	44
1.1	2.2	3.1	4.2	5.2	7.3	8.1	42	43
1.1	2.2	3.1	4.2	5.2	7.3	8.1	37	38
1.1	2.1	3.1	4.2	5.2	7.1	8.1	36	36
1.1	2.2	3.1	4.2	5.2	7.2	8.1	38	38
1.1	2.1	3.2	4.2	5.2	7.3	8.1	40	40
1.2	2.1	3.1	4.2	5.2	7.3	8.1	38	38
1.1	2.1	3.1	4.1	5.2	7.3	8.1	38	38
1.1	2.1	3.1	4.2	5.2	7.1	8.1	40	40

## EXPERIMENTAL GROUP

DEMOGRAPHIC VARIABLES							STRESS SCORE		LEVEL OF SATISFACTION
AGE	GEN	TYE	PQ	PKIVRT	WA	POS	PRETEST	POSTTEST	
1.1	2.2	3.1	4.2	5.2	7.1	8.1	44	41	42
1.1	2.2	3.1	4.2	5.2	7.3	8.1	41	35	41
1.1	2.2	3.1	4.2	5.2	7.1	8.1	38	28	42
1.1	2.2	3.1	4.2	5.2	7.1	8.1	41	32	42
1.2	2.2	3.2	4.2	5.2	7.1	8.1	38	33	42
1.1	2.2	3.1	4.2	5.2	7.1	8.1	40	30	41
1.1	2.2	3.1	4.1	5.2	7.3	8.1	39	30	39
1.1	2.2	3.1	4.2	5.2	7.1	8.1	39	30	39
1.1	2.2	3.1	4.2	5.2	7.1	8.1	42	30	42
1.1	2.2	3.1	4.1	5.1	7.1	8.1	40	31	42
1.1	2.2	3.1	4.2	5.2	7.2	8.1	42	30	42
1.2	2.2	3.2	4.2	5.1	7.3	8.1	38	30	42
1.1	2.2	3.1	4.2	5.2	7.1	8.1	40	30	42
1.1	2.2	3.2	4.2	5.2	7.1	8.1	44	33	42
1.2	2.2	3.1	4.2	5.2	7.2	8.1	43	31	41
1.2	2.2	3.1	4.2	5.2	7.2	8.1	38	32	41
1.1	2.2	3.2	4.1	5.2	7.2	8.1	40	31	42
1.1	2.2	3.1	4.1	5.2	7.2	8.1	39	32	42
1.1	2.2	3.1	4.2	5.2	7.3	8.1	37	28	42
1.1	2.2	3.1	4.2	5.1	7.1	8.1	42	33	42
1.1	2.2	3.1	4.2	5.2	7.2	8.1	41	31	41
1.1	2.2	3.1	4.2	5.2	7.1	8.1	43	34	41
1.1	2.2	3.1	4.2	5.2	7.3	8.1	41	31	41
1.1	2.2	3.1	4.2	5.2	7.2	8.1	39	34	41
1.1	2.2	3.1	4.2	5.1	7.2	8.1	41	34	42
1.1	2.2	3.1	4.2	5.2	7.2	8.1	44	34	42
1.1	2.2	3.1	4.2	5.2	7.1	8.1	40	32	42
1.1	2.2	3.1	4.2	5.2	7.1	8.1	41	33	42
1.1	2.2	3.1	4.1	5.2	7.3	8.1	41	34	42
1.2	2.2	3.2	4.2	5.1	7.1	8.1	44	34	41